United States
Department of
Agriculture

Economic
Research
Service

Agricultural
Economic Report
Number 502

The U.S. Poultry Industry

Changing Economics and Structure

Floyd A. Lasley

THE U.S. POULTRY INDUSTRY: Changing Economics and Structure. By Floyd A. Lasley, National Economics Division, Economic Research Service, U.S. Department of Agriculture. AER-502.

Abstract

While per capita consumption of poultry meat in 1981 has nearly doubled since 1960, retail prices rose only 74 percent for broilers, 67 percent for turkeys, and 59 percent for eggs. Vertical integration and technological advancements in the poultry industry have vastly improved production and efficiency, and enabled producers to hold costs down. Farm sales totaled $3.6 billion for eggs, $4.5 billion for broilers, and over $1.2 billion for turkeys in 1981, up from about $2 billion for eggs, $533 million for broilers, and $270 million for turkeys during the early fifties. Consumers paid only 86 percent more for poultry in 1981 than they did in 1960, compared with a 212-percent increase for all food.

KEY WORDS: Poultry, broilers, turkeys, eggs, prices, consumption, poultry marketing, vertical integration

Sales Information

Additional copies of this report can be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Ask for *The U.S. Poultry Industry: Changing Economics and Structure.* Write to the above address for price information or call the GPO order desk at (202) 783-3238 and charge the report to your Visa, MasterCard, or GPO Deposit Account. Discounts are available for purchases of more than 100 copies.

Microfiche copies ($4.50 each) can be purchased from the National Technical Information Service, Identification Section, 5285 Port Royal Road, Springfield, VA 22161. Ask for *The U.S. Poultry Industry: Changing Economics and Structure.* Enclose check or money order, payable to NTIS. Or call (703) 487-4780.

Washington, D.C. 20250

July 1983

Contents

Glossary of Terms

Broilers: Also called fryers or young chickens. Young chickens include broilers, fryers, roasters, capons, and cornish hens. Broilers, generally weighing from 2.5 to 4.8 pounds, dominate the series.

Cutup: Ready-to-cook poultry carcass cut into halves, quarters, or pieces.

Further processed: A poultry product prepared by cooking, smoking, raw boning, or dehydrating (excludes whole carcass packaged as such).

Real prices: Current prices deflated by a price index (CPI or PPI) so as to express prices in constant dollars.

Simulation: Computation of costs under specified situations using specified assumptions to compare changes.

Vertical Integration: Coordination of various levels of production-processing-distribution under one decisionmaking unit, generally through direct ownership of the different stages but may be done by contract. A completely integrated broiler operation, for example, will consist of breeder flocks, hatcheries, feed milling and delivery, growout (often by contract), assembly, processing plants, further processing, and delivery to buyers. An integrator develops each phase to mesh with the others so that inputs and products are handled as a flow process. Often ancillary services such as building and equipment supplies, fuel, and financing are affiliated with the operation.

Summary

Vertical integration and technological advancements in the poultry industry have vastly improved production efficiency and enabled producers to hold costs down. Thus, while per capita consumption of poultry meat in 1981 nearly doubled since 1960, retail prices rose only 74 percent for broilers, 67 percent for turkeys, and 59 percent for eggs. This report looks at changes in the poultry industry during the last 25 years. It finds that:

- Vertical integration of the poultry industry was rapid, as small flocks gave way to large poultry enterprises, and developments in feeding and disease control enabled producers to raise flocks in large confined units throughout the year.

- Total farm sales of poultry rose to $3.3 billion for eggs, $4.3 billion for broilers, and over $1.2 billion for turkeys in 1980, compared with about $2 billion for eggs, $533 million for broilers, and $270 million for turkeys during the early fifties. Consumers each spent about $19 for eggs, $34 for broilers, $2 for other chicken, and $10 for turkey in 1980.

- The average consumer is eating more broiler and turkey meat but fewer eggs. Per capita consumption of broilers rose from 13.8 pounds in 1955 to 48.6 in 1981, and from 4.1 pounds to 10.7 pounds of turkey, but fell from 360 eggs in 1955 to 265 eggs in 1981.

- Real prices for broilers, turkeys, and eggs are less than half what they were 25 years ago.

- About 1,100 farms each with more than 50,000 hens accounted for half of all hens in 1978. Farms with sales of more than 100,000 broilers accounted for 82 percent of all broilers sold. Almost half the turkeys were sold by 304 farms reporting sales of more than 100,000 head each.

- Sales of processed or cutup chicken and turkeys have increased faster than whole bird sales.

- Turkey consumption is less seasonal, as just over one-third of turkey consumption now occurs during the last quarter of the year, compared with more than one-half in 1960.

Each sector of the poultry industry has contributed to the gains that enable consumers to buy chicken, turkey, or eggs at favorable prices. No sector by itself would have made much difference, but the cumulative effect of changes in all sectors has been dramatic.

The U.S. Poultry Industry: Changing Economics and Structure

Floyd A. Lasley
Agricultural economist

Introduction

Few industries have enjoyed the success of the poultry industry in improving production and marketing efficiency during the past quarter century. Broiler and turkey producers have supplied increasing quantities of high-quality meat, and made it available year around at declining real prices. Advances in breeding, nutrition, housing, equipment, rearing, disease control, and management have all contributed to reducing the real costs of poultry production. The same is true in slaughter and processing, which benefited from uniform, high-quality birds, larger lots of birds, more stable production throughout the year, plant specialization, and new laborsaving equipment. Improvements in transportation and refrigeration enabled them to ship larger loads. Egg processors have likewise reduced costs.

A major factor in improving productivity has been the vertical integration of all aspects of production and marketing. Products are increasingly handled in a planned systematic flow rather than intermittent batches bought and sold at successive stages.

This report identifies some of the gains in efficiency in the poultry industry, and describes the changes and factors which caused or accompanied these gains. A simulation technique to measure the magnitude of these productivity gains and to illustrate the extent they have been passed on to consumers is developed and applied. A long-term view is provided in tabular and graphic summaries of trends in production, consumption, price, value, costs, and enterprise location over the past quarter century. Finally, prospects for further gains by the poultry industries are considered. As these industries mature, they will continue to improve, but the rate of change will probably slow.

Consumption Trends

The average consumer is eating more broiler and turkey meat but fewer eggs (table 1). Per capita consumption of broilers increased dramatically, from 13.8 pounds in 1955 to 48.6 in 1981. Per capita consumption increased in all but 5 years, 4 of them during the seventies. The increase should continue, although at a slower rate, during the eighties.

This increase in per capita consumption of broilers was sustained by improving product quality and availability, and especially by relatively favorable retail price. Cutup chickens, parts, and numerous further processed items have appealed to consumers and helped expand consumption. Fast food chains have also found chicken an attractive and cost-favorable menu item.

Per capita consumption of turkey has risen by about 2 pounds each decade—from 4.1 pounds in 1950 to 10.7 pounds in 1981 (table 1). Consumption has remained high during the Thanksgiving and Christmas seasons, but further processing and regular use by institutional food service outlets have made turkey widely available and acceptable at other times as well. In 1980, just over one-third of the yearly turkey consumption was during the last quarter of the year. Twenty years earlier, over half the yearly total was consumed during the last quarter. Over the 20-year period, fourth quarter consumption rose by 16 percent, but consumption for the other three quarters rose by 141 percent. Costs were reduced by extending use of production and processing facilities to year-round operations. Increased production and productivity helped lower the price to consumers, and lower prices helped increase consumption.

Item	1960	1980
	Pounds	
Annual turkey consumption per capita	6.15	10.49
Oct.-Dec. turkey consumption per capita	3.47	4.04
	Percent	
Oct.-Dec. turkey consumption as percentage of entire year	56	38

Egg consumption has stabilized near 270 eggs per capita after declining from about 360 in the midfifties (table 1). Much of this decline is thought to be associated with changing eating patterns and consumer preferences, that is, lighter breakfasts and consciousness of diets. However,

a new development has been the gaining popularity of fast food breakfasts. Prepared foods have replaced a major part of home baking, raising demand for liquid and dried egg products.

Prices

Productivity gains in poultry production and distribution allowed poultry producers to continue to expand output despite declining poultry prices during most of the fifties through the seventies. Quick supply response to short-term profitable markets ensured that these gains were passed on to the consumer. Farm, wholesale, and retail prices tended to move together closely (table 2).

This combination of quick positive supply response, resistance to cutting output when losses occur, rapid adoption of technology, and vigorous competition has kept prices near and closely related to the cost of production. Between 84 and 90 percent of the annual changes in both wholesale and retail prices for eggs, broilers, and turkeys is associated with changes in feed costs (table 3).

From 86 to 96 percent of the price changes for poultry products are explained by changes in cost to the wholesale level. Wholesale price changes account for 93 to 99 percent of yearly retail price changes. Simple correlation of monthly prices for 1960-80 showed an association (r^2) of 0.92 to 0.99 between the farm price and the wholesale and retail prices for eggs, broilers, and turkeys. In other words, price changes for the products were very closely associated at farm through retail.

The farm-to-retail price spread has increased for all three poultry products. Despite the close relationships among farm, wholesale, and retail prices, the amount of the price spread depends more on marketing costs—labor, transportation, packaging, and similar services—than on farm costs. Thus, over time, price spreads will adjust to reflect these costs. Increased efficiency in processing has held the rate of increase in farm-to-retail price spreads well below the general rate of inflation. Price spreads also tend to be less variable than product prices, because prices of these marketing inputs are less variable than farm prices. Output levels and feed prices are the major supply factors causing poultry prices to fluctuate.

Table 1--Per capita consumption of poultry and meats

Year	Eggs	Chicken			Turkey	Chicken and turkey	Beef	Veal	Pork	Lamb and mutton	Red meats	Red meat and poultry
		Young	Mature	Total								
	Number	*Pounds, RTC basis*[1]					*Pounds, retail basis*					
1955	360.2	13.8	7.5	21.3	5.0	26.3	64.0	7.8	61.9	4.1	137.8	164.1
1956	358.2	17.3	7.1	24.4	5.2	29.6	66.2	7.9	62.2	3.9	140.2	169.8
1957	351.3	19.1	6.4	25.5	5.9	31.4	65.1	7.3	56.6	3.6	132.6	164.0
1958	343.3	22.0	6.1	28.1	5.9	34.0	61.5	5.6	55.9	3.6	126.6	160.6
1959	341.3	22.8	5.9	28.9	6.3	35.2	61.8	4.7	62.7	4.2	133.4	168.6
1960	320.5	23.4	4.4	27.8	6.1	33.9	64.2	5.1	60.4	4.2	133.9	167.8
1961	318.1	25.9	4.0	29.9	7.4	37.3	65.9	4.6	57.7	4.4	132.6	169.9
1962	319.5	25.8	4.0	29.8	7.0	36.8	66.2	4.6	59.1	4.5	134.4	171.2
1963	313.8	27.1	3.6	30.7	6.8	37.5	69.8	4.1	61.0	4.3	139.2	176.7
1964	317.8	27.7	3.5	31.2	7.3	38.5	73.9	4.3	60.9	3.7	142.8	181.3
1965	313.1	29.6	3.7	33.3	7.4	40.7	73.6	4.3	54.7	3.3	135.9	176.6
1966	312.3	32.0	3.6	35.6	7.8	43.4	77.0	3.8	54.3	3.5	138.6	182.0
1967	320.7	32.4	4.1	36.5	8.5	45.0	78.8	3.2	59.9	3.5	145.4	190.4
1968	315.5	32.8	3.9	36.7	7.9	44.6	81.2	3.0	61.4	3.3	148.9	193.5
1969	310.3	34.8	3.6	38.4	8.2	46.6	82.0	2.7	60.5	3.0	148.2	194.8
1970	309.0	36.8	3.6	40.4	8.0	48.4	83.9	2.6	63.2	2.9	152.6	201.0
1971	310.6	36.5	3.8	40.3	8.3	48.6	83.3	2.4	69.2	2.8	157.7	206.3
1972	302.9	38.2	3.6	41.8	8.9	50.6	85.4	2.1	63.7	3.0	154.2	204.8
1973	289.2	37.2	3.3	40.5	8.5	48.9	80.6	1.7	58.1	2.4	142.8	191.7
1974	283.7	37.2	3.5	40.7	8.8	49.5	85.6	2.1	62.9	2.0	152.6	202.2
1975	277.1	36.7	3.4	40.1	8.5	48.5	87.9	3.7	51.6	1.8	145.0	193.5
1976	270.0	39.9	2.9	42.8	9.1	51.8	94.3	3.5	54.6	1.6	154.0	205.8
1977	267.0	41.1	3.1	44.2	9.1	53.2	91.6	3.4	56.7	1.6	153.3	206.6
1978	272.2	43.8	2.9	46.7	9.1	55.8	87.1	2.6	55.9	1.3	146.9	202.7
1979	277.5	47.7	2.9	50.6	9.9	60.4	78.0	1.8	63.8	1.3	144.9	205.4
1980	273.2	47.0	3.1	50.2	10.5	60.6	76.5	1.7	68.3	1.3	147.8	208.4
1981	265.0	48.6	3.1	51.7	10.7	62.4	77.3	1.7	65.0	1.5	145.5	207.9

[1]RTC = Ready-to-cook basis.

Sources (*17, 18, 20*). Italicized numbers in parentheses refer to items in the bibliography.

Table 2--Prices and farm-to-retail price spreads for eggs, broilers, and turkeys

Year	Eggs			Broilers			Turkeys[1]		
	Farm value	Retail, grade A large	Farm-to-retail spread	Farm value, RTC[2]	Retail	Farm-to-retail spread	Farm value, RTC[2]	Retail	Farm-to-retail spread
	Cents/dozen			*Cents/pound*					
1955	40.8	60.3	19.5	35.4	55.2	19.8	40.9	61.6	20.7
1956	40.4	60.0	19.6	27.5	48.9	21.4	33.8	56.9	23.1
1957	37.4	57.1	19.7	26.4	47.2	20.8	31.5	50.8	19.3
1958	39.5	60.1	20.6	25.9	46.1	20.2	30.9	52.6	21.7
1959	31.4	52.6	21.2	22.5	41.2	18.7	34.4	51.3	16.9
1960	37.1	56.9	19.8	23.4	42.4	19.0	36.2	55.5	19.3
1961	35.9	56.8	20.9	19.8	38.3	18.5	22.0	44.8	22.8
1962	32.2	53.5	21.3	21.5	40.5	19.0	29.7	49.0	19.3
1963	33.4	54.5	21.1	20.5	40.8	20.3	29.7	49.4	19.7
1964	32.9	53.8	20.9	20.1	38.6	18.5	27.2	46.8	19.6
1965	32.2	52.3	20.1	21.0	39.6	18.6	28.9	48.1	19.2
1966	39.2	59.3	20.1	21.7	41.6	19.9	29.9	50.4	20.5
1967	29.0	49.3	20.3	18.6	38.7	20.1	25.5	48.7	23.2
1968	32.4	52.8	20.4	20.0	40.8	20.8	25.1	46.4	21.3
1969	41.3	62.0	20.7	21.3	43.4	22.1	27.5	49.1	21.6
1970	38.3	61.2	22.9	18.5	41.7	23.2	30.2	56.1	25.9
1971	30.0	53.4	23.4	18.7	42.0	23.3	29.9	56.3	26.4
1972	29.5	53.2	23.7	19.2	42.7	23.5	30.2	56.6	26.4
1973	52.4	78.4	26.0	33.9	60.8	26.9	58.1	90.3	32.2
1974	51.8	78.1	26.3	30.0	57.0	27.0	40.4	71.4	31.0
1975	49.4	76.9	27.5	35.7	64.3	28.6	46.4	78.3	31.9
1976	54.2	84.1	29.9	30.9	61.2	30.3	37.9	73.2	35.3
1977	50.8	81.7	30.9	31.2	61.9	30.7	48.9	77.3	28.4
1978	46.9	77.0	30.1	34.9	66.5	31.6	59.2	87.7	28.5
1979	52.1	84.5	32.4	35.1	67.7	32.6	63.0	88.2	25.2
1980	49.5	84.7	35.2	38.2	71.9	33.7	61.8	95.7	33.9
1981	54.5	90.6	36.1	37.6	73.7	36.1	42.3	92.7	50.4

[1]Average for Oct.-Dec. [2]RTC = Ready-to-cook basis. Sources (*3, 4, 16, 20*).

Table 3--Correlation of retail and wholesale prices against selected variables for eggs, broilers, and turkeys, annual basis, 1955-80[1]

Item	Unit	Egg price		Broiler price		Turkey price	
		Retail	Wholesale	Retail	Wholesale	Retail	Wholesale
Feed cost:							
Correlation (r^2)	Percent	0.901	0.880	0.901	0.895	0.847	0.836
Coefficient	Cents	1.9413	1.7552	3.4705	2.3608	3.4094	2.4372
Standard error	do.	.1311	.1322	.2352	.1654	.2962	.2200
Nonfeed cost:							
Correlation (r^2)	Percent	.736	.691	.703	.723	.832	.736
Coefficient	Cents	5.7543	5.1034	9.2839	6.4280	9.8938	6.6940
Standard error	do.	.7035	.6959	1.2316	.8112	.9089	.8186
Total unit production cost:							
Correlation (r^2)	Percent	.893	.864	.919	.920	.907	.872
Coefficient	Cents	1.5073	1.3572	2.7408	1.8720	2.7286	1.9241
Standard error	do.	.1067	.1097	.1662	.1126	.1784	.1506
Unit cost to wholesale:							
Correlation (r^2)	Percent	.902	.871	.955	.924	.908	.865
Coefficient	Cents	1.1601	1.0427	1.5439	1.0365	1.7312	1.2153
Standard error	do.	.0780	.0821	.0685	.0608	.1127	.0981
Wholesale price:							
Correlation (r^2)	Percent	.987	--	.967	--	.928	--
Coefficient	Cents	1.0860	--	1.4407	--	1.3395	--
Standard error	do.	.2518	--	.0544	--	.0761	--

-- = Not applicable.

[1]Simple correlation (r^2) shows percentage of variation in dependent variable associated with (or explained by) changes in the independent variable. It does not account for other changes. The coefficient indicates the units of change in dependent price for each unit change in the independent variable.

Consumer Expenditures

Consumers have increased their expenditures for poultry products. Per capita expenditures more than quadrupled for broilers and more than tripled for turkeys during the last 25 years (app. table 3). Expenditures for eggs increased only slightly on a per capita basis, due entirely to higher prices which just offset the decline in consumption. Most of the increase for broilers and turkeys, on the other hand, was because of much higher consumption, with only a relatively small increase in price. Consumers, by purchasing further processed items, have increased expenditures for poultry products even more than these data indicate.

Broiler Prices

Actual prices for broilers, contrary to the general price level, trended downward until 1959, when they stabilized at about 20 cents per pound (ready-to-cook [RTC] basis) at the farm and 40 cents retail, a level that held for about 14 years. Yielding to the economic pressures of rising input prices, the price at farm and at retail jumped by nearly one-half in 1973. The upward pressure on prices has continued so that live broilers averaged about 38 cents per pound (RTC equivalent) in 1981, with retail prices approximately 74 cents. In real terms, however, consumers now can buy broilers for less than half of what they paid 25 years ago (table 4). The consistent decline in real prices has been interrupted by only brief cyclical swings and the economic disruption of 1973.

Consumers responded to these relatively favorable prices by increasing consumption. Figure 1 relates per capita consumption of broilers to the deflated retail price (1967=base) for 1955-81. This simple graphic relationship appears to fit a normal demand curve very well. During 1955-81, the average response to a 10-percent decline in the real price of broilers at retail was a 13-percent increase in per capita consumption of broiler meat. This relationship held fairly stable except during the disruptive midseventies, even holding close if one compares 1970 with 1980. These relationships are portrayed in a different manner in figure 2, which shows per capita expenditure

Table 4--Actual and deflated retail prices and per capita consumption of eggs, broilers, and turkeys

Year	Eggs			Broilers			Turkeys		
	Retail price		Per capita consumption, egg equivalent	Retail price		Per capita consumption	Retail price		Per capita consumption
	Actual, grade A large	Deflated[1]		Actual	Deflated[1]		Actual	Deflated[1]	
	Cents/dozen		*Number*	*Cents/pound*		*Pounds*	*Cents/pound*		*Pounds*
1955	60.3	75.2	360.2	55.2	68.8	13.8	61.6	76.8	5.0
1956	60.0	73.7	358.2	48.9	60.1	17.3	56.9	69.9	5.2
1957	57.1	67.7	351.3	47.2	56.0	19.1	50.8	60.3	5.9
1958	60.1	69.4	343.3	46.1	53.2	22.0	52.6	60.7	5.9
1959	52.6	60.3	341.3	41.2	47.2	22.8	51.3	58.8	6.3
1960	56.9	64.1	320.5	42.4	47.8	23.4	55.1	62.1	6.1
1961	56.8	63.4	318.1	38.3	42.7	25.9	44.8	50.0	7.4
1962	53.5	59.1	319.5	40.5	44.7	25.8	49.0	54.1	7.0
1963	54.5	59.4	313.8	40.8	44.5	27.1	49.4	53.9	6.8
1964	53.8	57.9	317.8	38.6	41.5	27.7	46.8	50.4	7.3
1965	52.3	55.3	313.1	39.6	41.9	29.6	48.1	50.9	7.4
1966	59.3	61.0	312.3	41.6	42.8	32.0	50.4	51.9	7.8
1967	49.3	49.3	320.7	38.7	38.7	32.4	48.7	48.7	8.5
1968	52.8	50.7	315.5	40.8	39.2	32.8	46.4	44.5	7.9
1969	62.0	56.5	310.3	43.4	39.5	34.8	49.1	44.7	8.2
1970	61.2	52.6	309.0	41.7	35.9	36.8	56.1	48.2	8.0
1971	53.4	44.0	310.6	42.0	34.6	36.5	56.3	46.4	8.3
1972	53.2	42.5	302.9	42.7	34.1	38.2	56.6	45.2	8.9
1973	78.4	58.9	289.2	60.8	45.7	37.2	90.3	67.8	8.5
1974	78.1	52.9	283.7	57.0	38.6	37.2	71.3	48.3	8.8
1975	76.9	47.7	277.1	64.3	39.9	36.7	78.3	48.6	8.5
1976	84.1	49.3	270.0	61.2	35.9	39.9	73.2	42.9	9.1
1977	81.7	45.0	267.0	61.9	34.1	41.1	77.3	42.6	9.1
1978	77.0	39.4	272.2	66.5	34.0	43.8	87.7	44.9	9.1
1979	84.5	38.9	277.5	67.7	31.1	47.7	88.2	40.6	9.9
1980	84.7	34.3	273.2	71.9	29.1	47.0	95.7	38.8	10.5
1981	90.6	33.3	265.0	73.7	27.1	48.6	92.7	34.0	10.7

[1]Deflated prices are current prices deflated by the CPI for all items, 1967=100.

(in deflated dollars) rising as real price declines. These comparisons do not present estimates of price elasticity. Rather, these are simple comparisons relating actual change in real price, quantity, and expenditures for a single commodity without considering other variables such as income measures, other prices, or quantity of other meats or substitutes.

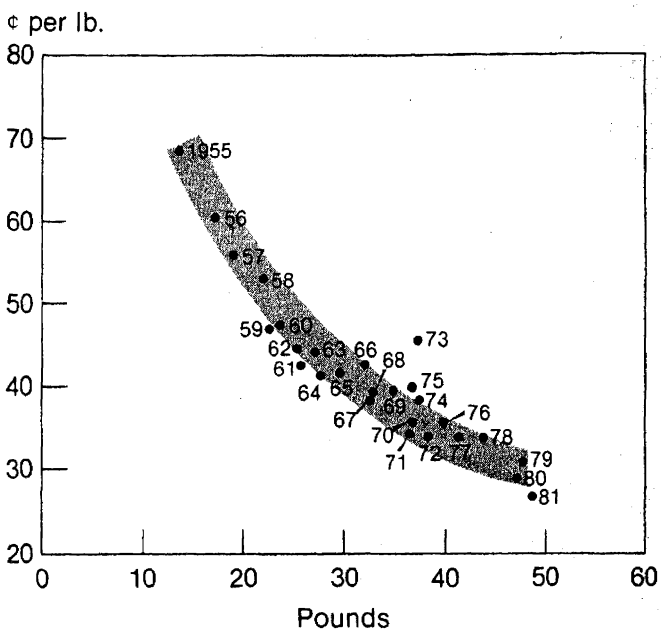
Turkey Prices

Prices for turkeys have followed a pattern similar to that for broilers. Actual live and retail turkey prices moved lower until the rapid inflation of 1973. Prices then responded to rapidly rising costs and higher prices for other foods. These pressures have continued to move current prices up, although real (deflated) prices have continued their downward trend. On an annual basis, turkey prices have shown a more cyclical pattern than broiler prices.

Measured in constant 1967 dollars, the average *real* price of turkey meat at retail dropped from 77 cents per pound in 1955 to 34 cents in 1981. Consumers responded by doubling per capita consumption, from 5 to 10.7 pounds (fig. 3). During this period, as real prices dropped by 10 percent, per capita consumption increased by about 10 to 11 percent so that real expenditures for turkey rose

Figure 1

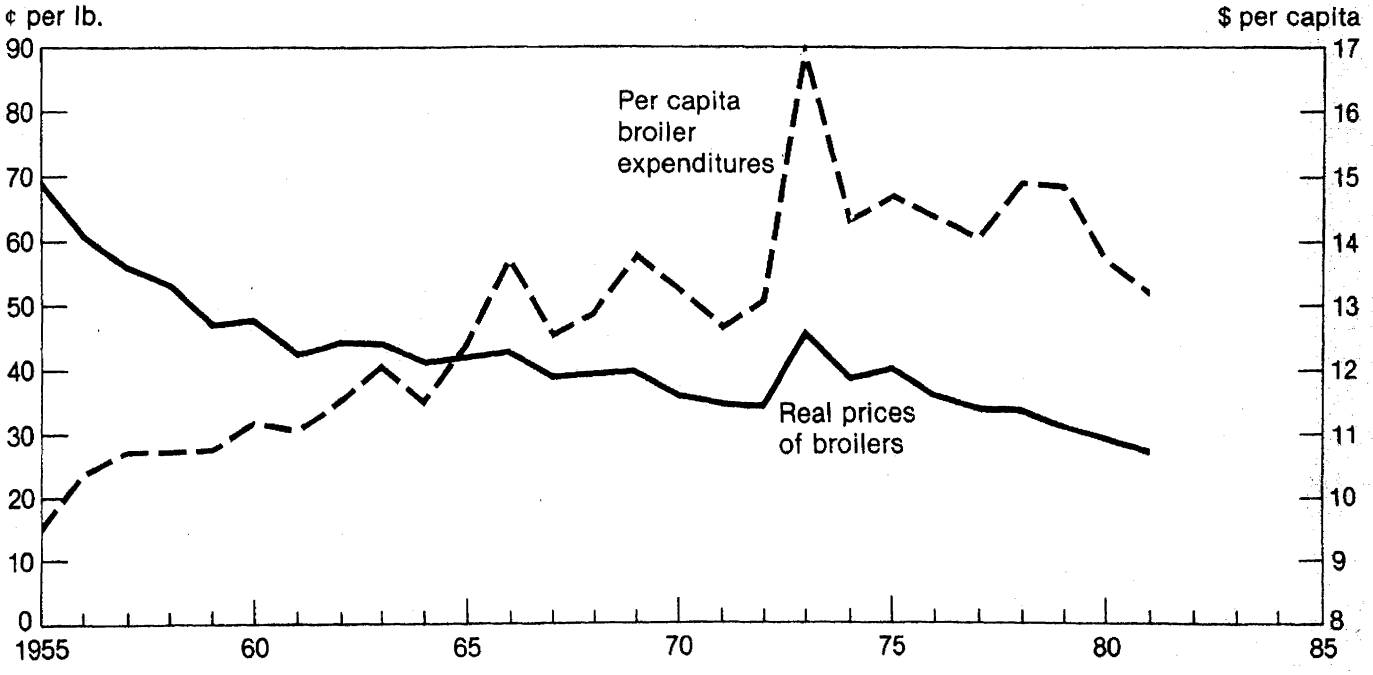
Per Capita Broiler Consumption and Real Retail Prices*



*Prices in 1967 constant dollars.

Figure 2

Per Capita Broiler Expenditures and Real Retail Prices*



*Prices and expenditures in 1967 constant dollars.

slightly—quantity increased about in proportion to the drop in price.

Egg Prices

Technical progress in egg production and marketing has also reduced the real price of eggs (table 4). Economic disruptions in 1973 led to a jump in both current and real prices, but real prices worked their way back down so that by 1981, consumers paid less than half the real price of 25 years earlier.

Declining per capita consumption depressed egg prices. This decline, combined with the ability to expand production via new technology, frequently drove prices below cost of production. The result has been the cyclical pattern evident in table 5 as one overreaction in production adjustment gave way to the next.

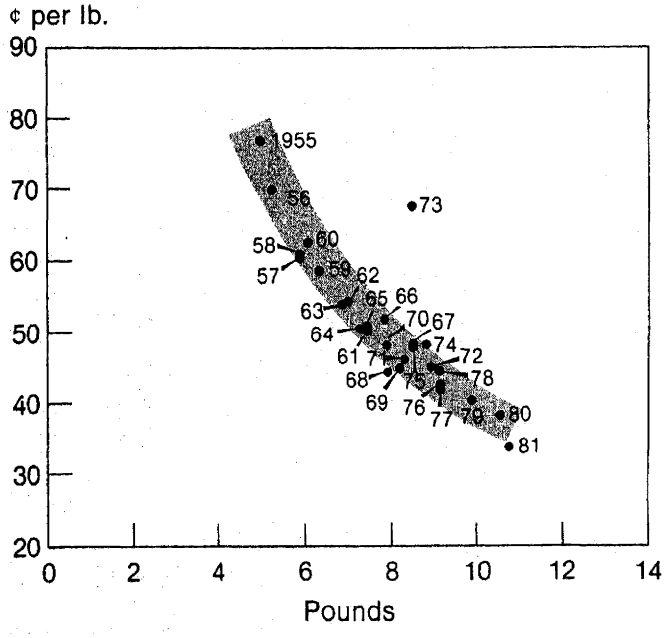
Egg consumption, unlike that for broilers and turkeys, did not increase with lower prices. Although consumers do respond to price changes for eggs, these shifts indicate a decline in demand—a series of new, reduced demand curves over the past quarter century.

Poultry Products Versus Other Foods

Poultry producers adjust the volume produced by expanding when the poultry enterprise is favorable (relative to alternatives) and by cutting back when unfavorable. Consumers respond by purchasing more poultry products when prices are low and reducing purchases when poultry prices are high. These responses to market prices help bring about the adjustments necessary to elicit the approximate quantity of the product desired by the market and, likewise, to allocate available supplies according to consumer preferences.

Figure 3

Per Capita Turkey Consumption and Real Retail Prices*



*Prices in 1967 constant dollars.

A number of prices can be compared over time most easily by using price indices (table 5). Three types of price adjustments are evident:

- Economic pressures external to the food industry.
- Cyclical movements within each specific food industry.
- Longer term trends within each food industry.

External influences are evident in the consumer price index (CPI) for all items (table 5, column 1). External pressures which heavily influenced food prices during this 31-year period included immediate postwar adjustments with price stability during the early fifties, the Korean War, Vietnam, the rapid inflation heightened by OPEC during 1973-75, and the renewed inflation of 1978-81. The CPI for all food (table 5, column 2) tends to follow the overall index very closely. Food prices did not quite keep up with the overall index during 1966-72, but with the grain and protein shortfall, food prices spurted ahead during 1973-75. Since 1975, these two series again moved up at about the same rate, with the CPI gaining slightly on the food price index. Such similarity is to be expected because costs of production and marketing are subject to many of the same economic pressures.

Cyclical price swings, resulting from interaction of supply and demand (but primarily from changes in quantities produced) are evident in the specific industries. Beef prices fell early in the period, held stable for about 5 years, moved up, and stabilized again before starting another cycle. Pork prices moved up six times during 1950-81, but also fell six times, although inflation left 1981 pork prices about 2-1/2 times as high as in 1951.

Likewise, prices for all poultry, frying chicken, turkey, and eggs demonstrate cyclical swings. The marked downward trend until the midsixties, however, is the most significant characteristic of these poultry indices. None of the other foods show any such trend. Except for brief cyclical upturns, poultry indices fell until the midsixties when they trended upward, although well below the rate of inflation and of price indices for other foods. Poultry prices continue to fall relative to prices of other foods and to prices in general.

In absolute terms, retail prices for poultry products are well below those of other animal protein foods on a per pound basis. In 1981, consumers paid 74 cents per pound for broilers, 93 cents per pound for turkeys, and 91 cents per dozen for grade A large eggs (equivalent to 61 cents per pound); at the same time, they paid $2.39 for a pound of choice beef (composite or weighted average retail value), and $1.52 per pound for pork (composite value). Consumers responded to these prices by increasing poultry meat consumption.

Vertical Integration

Vertical integration has been both cause and effect of most of the changes in the poultry industry since World War II. Developments in feeding and disease control enabled producers to raise chickens and turkeys in large confined units at any time of the year. Those using the new technologies realized a cost advantage from improved efficiency. New technology, however, also meant substantial investment in housing and equipment. Operating expenses for chicks, poults, feed, and other inputs also increased the need for financing. Growth did not occur uniformly, nor without cost. Output expanded so rapidly that poultry and egg prices were at times forced below cost of production. Both the amount of capital needed and the heavy financial risk were deterrents to independent growers and gave an advantage to the integrated systems. In turn, integrators have implemented improved methods.

Vertical integration, either via ownership or contracting, offered several potential advantages and opportunities. Financing could be more readily obtained because risk to any particular segment was reduced and shared. Integration also provided the vehicle for coordinating all phases of production and marketing so that input and output could be standardized and each set of facilities used more fully. Poultry enterprises were probably more suited to vertical integration than most other forms of animal agriculture. Flocks were generally very small and were secondary enterprises on the farm. Significant break-

Table 5--Selected consumer and food price indices

Year	Consumer price index	Food	Poultry	Frying chicken	Turkey	Eggs	Meats	Beef and veal	Pork
				1960=100					
1950	81.3	84.7	132.7	132.6	N.A.	104.6	92.1	93.2	93.6
1951	87.7	94.1	139.0	139.0	N.A.	127.3	104.4	108.8	99.3
1952	89.6	95.8	139.6	139.5	N.A.	116.3	103.4	107.9	98.2
1953	90.3	94.3	136.0	136.1	N.A.	123.1	96.6	85.0	109.3
1954	90.8	94.1	122.8	122.8	N.A.	103.0	96.0	81.9	112.7
1955	90.4	92.7	127.9	127.8	111.8	106.4	88.4	81.0	97.1
1956	91.8	93.4	112.1	112.1	103.3	105.8	85.4	79.8	92.2
1957	95.0	96.5	109.3	109.2	92.2	100.8	95.0	85.7	106.1
1958	97.6	100.6	108.0	108.0	95.5	106.0	105.7	99.7	113.1
1959	98.4	99.0	98.4	98.4	93.1	92.8	101.8	102.6	100.6
1960	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1961	101.0	101.3	90.3	90.3	81.3	100.0	101.3	98.4	104.7
1962	102.1	102.1	95.4	95.4	88.9	94.5	103.3	102.0	105.6
1963	103.4	103.6	93.9	94.0	89.7	95.9	101.7	100.8	102.9
1964	104.7	105.0	91.9	91.9	84.9	95.0	100.1	97.8	102.4
1965	106.5	107.3	94.7	95.0	87.3	92.8	107.7	102.5	116.6
1966	109.6	112.6	99.8	100.6	91.5	105.7	117.7	107.9	133.4
1967	112.7	113.6	93.6	93.0	88.4	88.3	114.7	108.6	122.4
1968	117.5	117.7	96.5	97.6	84.2	95.2	117.3	113.0	122.6
1969	123.8	123.8	102.0	103.3	89.1	112.0	127.8	124.3	133.5
1970	131.1	130.6	101.4	99.9	101.8	111.0	134.9	129.8	141.9
1971	136.8	134.5	102.0	100.9	102.2	95.8	133.8	135.6	128.5
1972	141.3	140.3	103.3	101.9	102.7	95.1	148.2	148.3	148.8
1973	150.1	160.7	144.8	147.1	163.9	141.5	184.7	177.9	197.9
1974	166.5	183.8	137.4	137.9	129.6	142.1	188.6	183.0	197.1
1975	181.7	199.3	151.9	155.3	142.1	139.4	204.0	184.6	241.0
1976	192.2	205.5	145.7	146.6	132.9	152.3	204.4	178.6	244.2
1977	204.6	218.4	146.6	147.4	140.3	147.4	199.8	177.6	231.1
1978	220.3	240.2	161.7	163.3	159.2	139.4	237.2	218.4	260.8
1979	245.1	266.5	169.8	166.4	160.1	152.7	277.4	277.7	264.9
1980	278.2	289.3	178.5	180.1	173.7	149.9	285.3	293.5	255.9
1981	307.0	311.9	185.9	184.6	168.2	162.3	295.7	296.0	279.8

N.A. = Not available on comparable basis.

throughs in nutrition, breeding, and disease control were also made within a short time, and the short productive and reproductive cycle for poultry meant that change could be accomplished quickly. Poultry production was also amenable to separation into highly specialized phases. All these factors contributed to the ability to exert more control over production variables than was possible with most forms of animal agriculture.

Integration is most complete in the broiler industry, with 99 percent owned or contracted for by the integrators in 1977 (table 6). About 90 percent of turkeys and market eggs are integrated, with direct ownership more common than for broilers. The market outlet is determined before the eggs, broilers, or turkeys are produced.

Farm Production

The major changes in the structure of egg production are the marked reduction in number of producers and the dramatic growth in size of production units. The 1949 Agricultural Census showed 2.4 million farms reporting sales of eggs. This number dropped to 1.1 million in 1959; in 1978, of farms with sales of $2,500 or more, only 45,798 reported egg sales—or 2 percent of the number three decades earlier. Less than 4 percent of these farms had 87.5 percent of all laying hens.

Egg production is thus no longer a sideline enterprise. Although 80 percent of the farms with at least $2,500 in sales and hens of laying age had fewer than 100 hens in 1978, they had just 1.2 percent of all hens and tallied only a negligible amount of egg sales (table 7). At the other end of the spectrum, large farms have been getting larger. In 1959, half the total egg supply was sold by 31,391 farms, the top 3 percent of farms selling eggs (table 7). By 1978, just over 1,100 farms, each with more than 50,000 hens, reported about half the total laying flock. The largest 405 farms, only 0.2 percent of the total, had an inventory of 97 million hens, nearly one-third of all hens.

Table 6--Integration of market egg, broiler, and turkey production, selected years

Item	1955	1960	1965	1970	1975	1977
			Percent			
Market eggs:						
Contract production	0.5	7.0	18.0	20.0	37.0	44.0
Owner-integrated production	1.5	5.5	12.5	20.0	32.0	37.0
Contract marketing	12.5	13.5	13.5	15.0	10.0	9.0
Total	14.5	26.0	44.0	55.0	79.0	89.0
Commercial broilers:						
Contract production	87.0	90.0	90.0	90.0	90.0	88.0
Owner-integrated production	2.0	5.0	5.5	7.0	8.0	10.0
Contract marketing	1.0	1.0	1.5	2.0	1.0	1.0
Total	90.0	96.0	97.0	99.0	99.0	99.0
Market turkeys:						
Contract production	21.0	30.0	35.0	42.0	47.0	52.0
Owner-integrated production	4.0	4.0	8.0	12.0	20.0	28.0
Contract marketing	11.0	11.0	13.0	18.0	14.0	10.0
Total	36.0	50.0	56.0	72.0	81.0	90.0

Source (*12*).

The top 47 egg production companies—those with 1 million or more hens—had 37.1 percent of the Nation's layers in 1980 (*23*).[1] The largest firm had 10 million layers; the largest number of layers at one location was 3.1 million. Development of these very large production units has required new buildings and equipment which have further increased labor efficiency and the productivity of hens. Rapid adoption of superior technology has thus been achieved, even though the industry has not substantially expanded output.

The number of farms selling broilers has declined slowly, but the major change is the greater number of broilers sold per farm, realized by increasing both capacity per brood and number of broods per year. In 1978, one-third of the farms reporting broiler sales sold over 100,000 each; these farms sold about 82 percent of the total broilers (table 8). Small flocks have not provided any significant portion of the total broiler supply since the late forties. This is emphasized by the 1978 data showing that the 13,590 farms selling fewer than 30,000 birds sold less than 1 percent of the total broiler supply (table 8).

Turkey production changed from a secondary farm enterprise to a highly specialized industry during 1960-81. The number of farms producing turkeys, as listed in the Agricultural Census, dropped from 162,244 in 1949 to only 26,638 in 1978. The average producer now sells more than $200,000 worth of turkeys in a year. Nearly two-thirds of these farms were producing just for home use, so only 7,271 of them reported selling turkeys in 1978 (table 9). During the past quarter century, most turkeys were produced on a relatively small number of farms. By 1978, one-fourth of the farms (1,932 farms selling more than 16,000 turkeys each) sold 95 percent of all turkeys. Almost half of the turkeys were sold by the 304 farms selling more than 100,000 head each, illustrating how a few farms developed into very large and specialized production units.

Location

The shifts in regional production that actually occurred would have appeared quite unlikely if one had projected

[1]Italicized numbers in parentheses refer to items in the bibliography.

them during the early fifties. At that time, the South was deficit in poultry and was shipping products in from other regions (fig. 4). Broilers were expanding to the point that the South was becoming self-sufficient, but it was another decade before the region achieved a balance in eggs. Turkeys reached a balance and were even slightly in surplus here during the late seventies (table 10).

Today, the South (South Atlantic and South Central production areas) provides nearly 44 percent of the Nation's eggs, 88 percent of the broilers and 40 percent of the turkeys (table 11). Shipments of poultry products, especially broilers, are made from these southern areas to virtually all parts of the United States.

The North Central regions have followed a pattern almost the reverse of the South. The West North Central area was the only region with a surplus of eggs in the fifties, and shipped those eggs to all other areas. That surplus has dwindled to the point that it just about offsets the deficit of the East North Central area and egg production is now about in balance with consumption in these two regions combined. The West North Central region has also maintained a surplus of turkey production, as have the Mountain and Pacific regions. These, along with the South, ship turkey products since all other regions consume more than they produce.

The densely populated cities have made the North East and East North Central regions heavily deficit in all poultry products. Generally, this deficit has declined slightly for eggs but has grown for broilers and turkeys, and imports from surplus regions have increased, facilitating expansion by the southeastern production areas. Several

Table 7--Number of farms with hens or egg sales and distribution by size groups, selected years[1]

Hens per farm	1978				1974			
	Farms	Hens	Distribution		Farms	Hens	Distribution	
			Farms	Hens			Farm	Hens
	Number	*1,000*	*- - - Percent - - -*		*Number*	*1,000*	*- - - Percent - - -*	
1-99	145,003	3,583	80.0	1.2	144,911	4,255	73.0	1.5
100-399	20,341	3,590	11.2	1.2	33,738	5,977	17.0	2.1
400-1,599	4,235	2,807	2.3	.9	7,628	5,040	3.8	1.8
1,600-3,199	865	2,031	.5	.7	1,353	3,202	.7	1.1
3,200-9,999	3,855	25,631	2.1	8.5	4,267	26,921	2.1	9.6
10,000-19,999	3,353	45,147	1.8	15.0	3,402	45,187	1.7	16.1
20,000-49,999	2,516	74,380	1.4	24.8	2,365	67,398	1.2	24.0
50,000-99,999	707	46,093	.4	15.3	559	36,864	.3	13.1
100,000 or more	405	97,046	.2	32.3	354	85,812	.2	30.6
Farms with at least $2,500 in sales	181,280	300,308	100.0	100.0	198,577	280,646	100.0	100.0
All farms with hens	308,852	304,312	(2)	(2)	304,823	284,659	(2)	(2)

Dozen eggs sold per farm, by size group	1964			1959		
	Farms	Distribution		Farms	Distribution	
		Farms	Eggs sold		Farms	Eggs sold
	Number	*- - - - - - Percent - - - - - -*		*Number*	*- - - - - - Percent - - - - - -*	
1-399	199,841	38.0	.6	456,947	41.0	1.6
400-1,599	138,798	26.4	3.0	328,946	29.5	8.5
1,600-4,999	103,905	19.7	7.2	213,192	19.1	16.9
5,000-19,999	54,441	10.3	11.3	84,120	7.5	20.6
20,000-49,999	13,138	2.5	9.6	19,558	1.8	16.6
50,000-99,999	7,929	1.5	12.9	[3]11,833	[3]1.1	[3]35.7
100,000-499,999	7,577	1.4	33.0	N.A.	N.A.	N.A.
500,000-1,999,999	820	.2	15.8	N.A.	N.A.	N.A.
2,000,000 or more	81	(4)	6.5	N.A.	N.A.	N.A.
Any egg sales	526,530	100.0	100.00	1,114,596	100.0	100.0

N.A. = Not applicable.

[1]"Hens" includes hens and pullets of laying age as listed by Agricultural Census. Farms in 1978 and 1974 are those reporting inventory of hens and with at least $2,500 in farm sales. Farms in 1964 and 1959 are those reporting sales of eggs; hens per farm were not reported by the Census for those 2 years. [2]Percentage computation made on basis of farms with at least $2,500 in sales rather than all farms with hens. [3]Size group includes sales of 50,000 dozen or more, as no further breakdown was reported by Census. [4]Less than 0.05 percent.

Source (*21*).

factors favor continued strength and expansion of the poultry industry, especially broilers and turkeys, in the South:

- Comparative advantages of climate, low-priced land, and areas that lack alternative uses for land and labor.
- Economies of aggregation and scale.
- Established integrated complex (breeder flocks-hatchery-feed mill-processing plant-further processing-rendering operation-growers-workers-houses) and the associated support to service the primary industry (financial, veterinary, supply, trans portation, laboratories, research, and educational).

The changing regional production pattern developed quite differently for eggs than for broilers and turkeys. Total egg production in 1980 was only about 18 percent above the 1950 level. Expansion occurred only in the South and West, accompanying a heavy decline in the North Central region. The North Central region dropped from 48 to 24 percent of U.S. egg production, while the South rose from 24 to 44 percent.

The broiler industry has expanded, with rapid growth and development in the South Atlantic and South Central areas, giving the South 88 percent of the Nation's broiler production. Other regions have increased output, but only by relatively small volumes.

The South, with a sixfold increase, has also been expanding turkey production more rapidly than other regions. All regions have increased production, although output declined in all Northeastern States except Pennsylvania. Production tends to be concentrated in relatively small areas in each region.

Volume and Value

Few major food commodities have experienced such rapid growth as broilers. The industry of 631 million birds in 1950 doubled by 1956, expanded to over 2 billion birds in 1962, 3 billion in 1972, and reached more than 4 billion in 1981.

Meanwhile, gross farm value of broiler production increased eightfold, from $533 million in 1950 to almost $4.5 billion in 1981 (fig. 4). Although returns were not always favorable during this period, broiler numbers

Table 8--Farms selling broilers and number of broilers sold by size groups, selected years[1]

Broilers per farm	1978				1974			
	Farms with sales	Sales of broilers	Distribution		Farms with sales[2]	Sales of broilers	Distribution	
			Farms	Sales			Farms	Sales
	Number	*1,000*	*- - - Percent - - -*		*Number*	*1,000*	*- - - Percent - - -*	
1-1,999	11,725	1,544	34.0	(3)	7,986	1,376	25.4	(3)
2,000-3,999	159	421	.5	3.1	206	567	.7	3.2
4,000-7,999	256	1,462	.7	(3)	345	1,976	1.1	(3)
8,000-15,999	555	6,510	1.6	.2	748	8,747	2.4	.3
16,000-29,999	895	19,992	2.6	.6	1,362	30,930	4.3	1.2
30,000-59,999	3,114	138,926	9.0	4.4	4,885	216,633	15.6	8.6
60,000-99,999	5,432	409,344	15.8	13.1	6,561	494,964	20.9	19.7
100,000-up	12,338	2,557,421	35.8	81.6	9,314	1,762,527	29.7	70.0
Total	34,474	3,135,619	100.0	100.0	31,407	2,517,720	100.0	100.0
	1964				1959			
	Farms with sales	Sales of broilers	Distribution		Farms with sales	Sales of broilers	Distribution	
			Farms	Sales			Farms	Sales
	Number	*1,000*	*- - - Percent - - -*		*Number*	*1,000*	*- - - Percent - - -*	
1-1,999	329	419	0.9	(3)	954	1,151	2.3	0.1
2,000-3,999	1,008	2,778	2.9	.1	2,388	6,497	5.7	.5
4,000-7,999	1,828	10,397	5.2	.5	4,473	25,287	10.6	1.8
8,000-15,999	4,345	50,988	12.4	2.7	8,347	96,769	19.8	6.8
16,000-29,999	6,868	150,836	19.6	7.9	10,334	222,889	24.5	15.7
30,000-59,999	10,460	433,297	29.8	22.6	9,587	384,480	22.7	27.1
60,000-99,999	5,890	438,118	16.8	22.9	3,848	277,524	9.1	19.6
100,000-up	4,400	828,541	12.5	43.3	2,254	404,663	5.3	28.5
Total	35,128	1,915,374	100.0	100.0	42,185	1,419,260	100.0	100.0

[1]Data for 1964 and 1959 are for broilers; data for 1978 and 1974 include broilers and other meat type chicken, primarily accounting for the larger number of farms in the smallest size size category. [2]Data for 1974 is for those farms with at least $2,500 total sales. [3]Sales combined for small size groups.

Source (*21*).

increased over the previous year in all but 4 years—1971, 1973, 1974, and 1975. With more birds and a heavier average weight, total pounds of ready-to-cook (RTC) broilers increased each year except 1973.

Expansion has also dominated turkey production. Output has trended steadily upward from 817 million pounds live weight in 1950 to 1.5 billion in 1960, 2.2 billion in 1970, and over 3.2 billion pounds in 1981 (fig. 4).

Gross farm value of turkey production increased from $270 million in 1950 to $1.2 billion in 1981. Gross farm income from turkeys increased much more slowly than did production, due to the general downturn in prices during the fifties and sixties. Lower returns per bird were probably both cause and effect of larger production units as most sideline producers dropped out and those remaining increased the sizes of their flocks.

In contrast to both broiler and turkey production, egg production has grown very slowly, from about 60 billion eggs during the fifties to almost 70 billion in 1981 (fig. 5). Production has responded to changing consumer preferences and declining per capita consumption and has not kept pace with population growth.

Gross farm income from eggs was about $3.6 billion in 1981, up from about $2 billion during the early fifties.

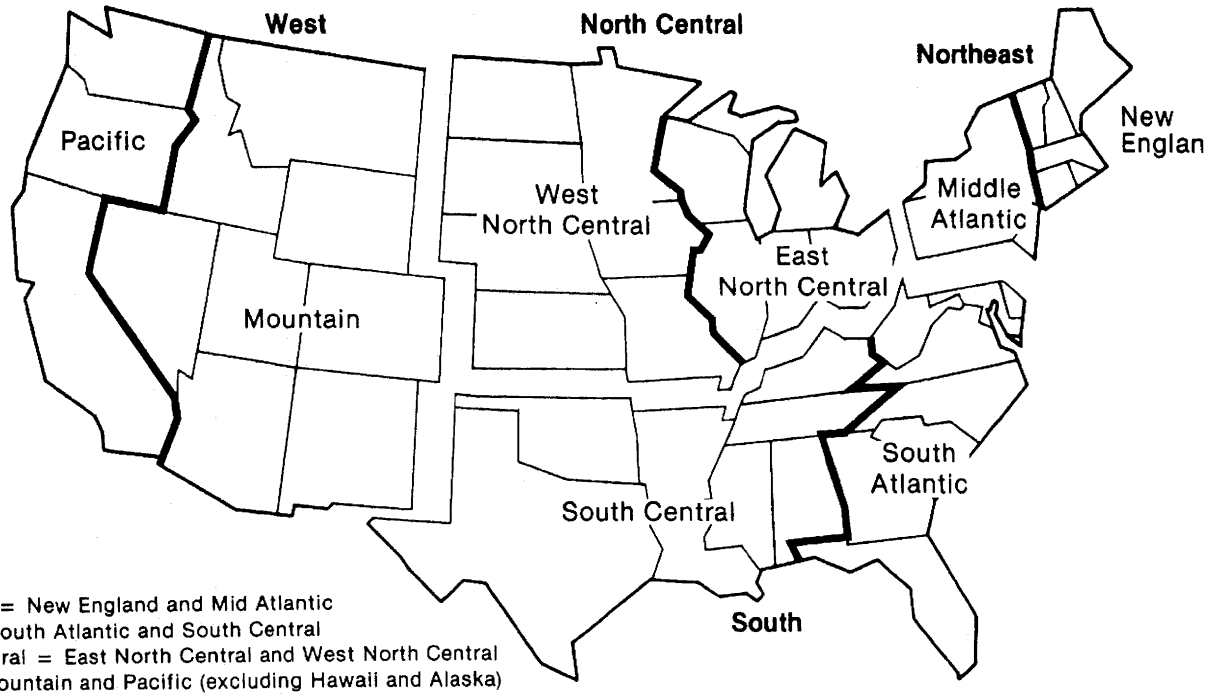
Table 9--Number of farms with turkeys raised or sold and number turkeys reported, selected years [1]

Turkeys sold per farm	Farms with sales	Sales of turkeys	Percentage distribution	
			Farms	Turkeys
	Number	*1,000*	- - - - - - - *Number* - - - - - - -	
1978				
1-1,999	4,485	273	61.7	0.2
2,000-3,999	128	359	1.8	.3
4,000-7,999	305	1,735	4.2	1.2
8,000-15,999	421	4,904	5.8	3.5
16,000-29,999	538	11,543	7.4	8.2
30,000-59,999	701	29,110	9.6	20.6
60,000-99,999	389	28,658	5.3	20.3
100,000 or more	304	64,721	4.2	45.8
Total	7,271	141,303	100.0	100.0
1974				
1-1,999	1,398	302	31.7	0.2
2,000-3,999	173	487	3.9	.4
4,000-7,999	425	2,377	9.6	1.9
8,000-15,999	648	7,371	14.7	5.9
16,000-29,999	584	12,595	13.3	10.1
30,000-59,999	645	26,115	14.6	20.9
60,000-99,999	294	21,529	6.7	17.3
100,000 or more	240	53,963	5.4	43.6
Total	4,407	124,738	100.0	100.0
1964				
1-24	29,719	219	71.0	0.2
25-99	4,124	171	9.9	.2
100-299	1,070	162	2.6	.2
300-999	691	379	1.7	.4
1,000-2,499	681	1,127	1.6	1.1
2,500-4,999	1,046	3,750	2.5	3.6
5,000 or more	4,531	98,942	10.8	94.5
Total	41,862	104,750	100.0	100.0
1959				
1-49	72,910	685	82.5	0.9
50-399	6,667	793	7.5	1.0
400-799	1,035	550	1.2	.7
800-1,599	1,191	1,370	1.3	1.7
1,600-3,199	1,476	3,566	1.7	4.4
3,200-9,999	2,976	17,149	3.4	21.3
10,000 or more	2,144	56,285	2.4	70.0
Total	86,838	82,521	100.0	100.0

[1]Data for 1978 is for total number farms selling turkeys; 1974 is for farms with sales of $2,500 selling turkeys; 1964 and 1959 data is for farms reporting turkeys raised. Different increments for survey years in number of turkeys sold reflect differences in how the Census survey data were reported.

Figure 4

Poultry Production-Marketing Regions



Northeast = New England and Mid Atlantic
South = South Atlantic and South Central
North Central = East North Central and West North Central
West = Mountain and Pacific (excluding Hawaii and Alaska)

Table 10--Regional production compared with consumption of eggs, young chickens, and turkeys, selected years[1]

Year	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	South Central	Mountain	Pacific
				1,000 cases, shell equivalent				
Eggs:								
1955	[2]-2,321	-8,812	-1,007	30,420	-8,938	-6,813	-1,500	-1,029
1960	-2,642	-10,784	-3,459	27,137	-4,397	-4,472	-2,314	931
1965	-2,298	-12,809	-7,630	18,081	1,771	2,762	-3,301	3,424
1970	-2,037	-15,057	-9,564	9,785	7,722	6,920	-3,295	5,527
1975	-389	-13,042	-8,554	7,811	6,870	4,364	-3,108	6,050
1979	-207	-12,771	-6,560	6,168	8,600	4,506	-3,865	4,129
1980	-391	-11,884	-6,500	6,160	8,258	4,633	-4,198	3,922
				Million pounds, RTC				
Young chicken (primarily broilers):								
1955	73.7	-338.4	-317.0	-131.5	682.1	215.2	-73.6	-110.6
1960	-1.9	-661.5	-662.0	-256.4	1,234.7	777.5	-146.3	-284.2
1965	-84.5	-939.0	-1,016.8	-316.0	1,592.3	1,475.1	-210.8	-455.4
1970	-194.8	-1213.9	-1,382.3	-494.5	2,018.3	2,167.7	-286.9	-613.7
1975	-211.2	-1,177.6	-1,398.3	-497.1	1,998.0	2,266.0	-355.5	-624.3
1979	-341.4	-1,461.8	-1,872.3	-692.1	2,759.5	3,079.5	-520.4	-951.1
1980	-364.2	-1,447.7	-1,870.3	-677.8	2,847.4	2,976.6	-553.2	-918.8
Turkey:								
1955	-33.3	-129.4	-63.0	167.3	-5.8	-59.6	25.5	98.2
1960	-56.0	-184.4	-66.1	297.4	-70.8	-63.8	28.6	115.2
1965	-77.4	-238.7	-76.9	362.0	-38.2	-36.9	35.8	81.4
1970	-87.8	-256.5	-118.6	336.3	31.2	-.3	39.7	56.0
1975	-101.9	-274.4	-144.7	408.3	75.2	-36.5	46.7	27.4
1979	-119.3	-301.3	-188.3	440.8	210.4	-53.2	17.3	-6.5
1980	-129.8	-308.5	-201.6	476.9	193.8	-51.2	12.2	8.1

[1]Northeast = Combined New England (Me., N.H., Vt., Ma., R.I., Ct.) and Middle Atlantic (N.Y., N.J., Pa.). East North Central (Oh., In., Il., Mi., Wi.). West North Central (Mn., Ia., Mo., N.D., S.D., Ne., Ks.). South Atlantic (De., Md., Va., W.V., N.C., S.C., Ga., Fl.). South Central (Ky., Tn., Al., Ms., Ar., La., Ok., Tx.). Mountain (Montana, Id., Wy., Co., N.M., Arz., Ut., Nev.). Pacific (Wash., Ore., Ca.). Excludes Hawaii and Alaska.

[2]Minus sign (-) indicates that consumption in region was greater than production and inshipments were made from surplus regions.

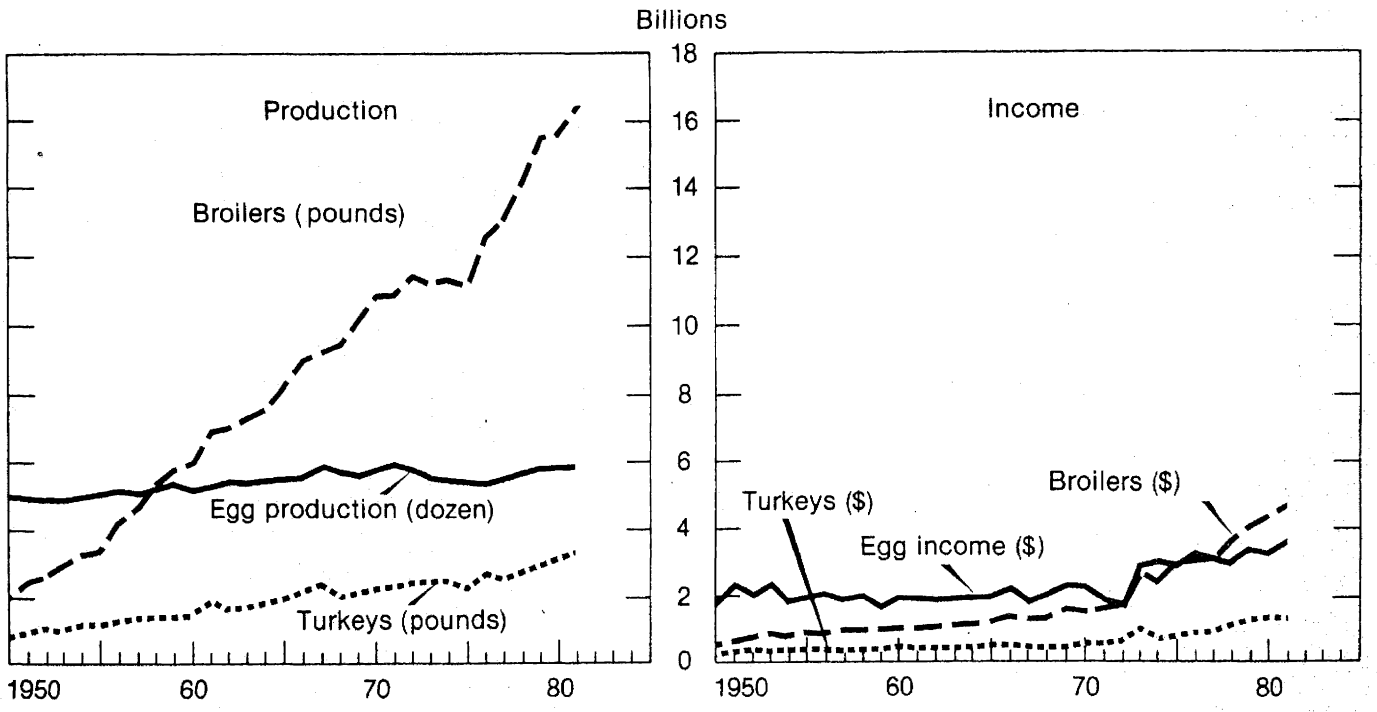
Table 11--Regional production of eggs, broilers, and turkeys, and as a percentage of total U.S. production, selected years,

Region	Eggs				Broilers				Turkeys			
	1950	1960	1970	1980	1950	1960	1970	1980	1950	1960	1970	1980
	Millions								*Thousands*			
New England	2,747	2,655	3,123	3,489	48	94	84	75	1,077	793	421	175
Mid-Atlantic	7,390	7,385	6,345	6,306	31	53	58	113	2,822	1,985	2,681	5,837
Northeast[1]	10,137	10,040	9,468	9,795	79	147	142	188	3,899	2,778	3,102	6,012
East North Central	11,743	10,798	9,313	9,701	53	79	40	41	5,368	11,719	15,431	15,481
West North Central	16,690	15,113	8,809	7,287	26	47	40	48	11,095	30,155	34,599	47,685
North Central[1]	28,433	25,911	18,122	16,988	79	126	80	89	16,463	41,874	50,030	63,166
South Atlantic	5,156	8,084	14,257	15,115	298	778	1,246	1,656	5,520	8,715	20,108	42,605
South Central	8,786	8,789	14,547	15,073	123	655	1,385	1,841	4,749	8,130	17,397	24,465
South[1]	13,942	16,873	28,804	30,188	421	1,433	2,631	3,497	10,269	16,845	37,505	67,070
Mountain	1,723	1,428	1,439	1,757	5	8	(1)	(1)	3,065	4,936	6,988	6,539
Pacific	4,719	7,210	10,246	10,729	48	82	1132	1190	10,096	15,910	18,378	21,956
West[1]	6,442	8,638	11,685	12,486	53	90	132	190	13,161	20,846	25,366	28,495
Total	58,954	61,462	68,079	69,457	632	1,796	2,985	3,964	43,792	82,343	116,003	164,743
	Percentage of total production											
New England	4.7	4.3	4.6	5.0	7.6	5.2	2.8	1.9	2.5	1.0	0.4	0.1
Mid-Atlantic	12.5	12.0	9.3	9.1	4.9	3.0	2.0	2.9	6.4	2.4	2.3	3.5
Northeast[1]	17.2	12.0	13.9	14.1	15.2	8.2	4.8	4.8	8.9	3.4	2.7	3.6
East North Central	19.9	17.6	13.7	14.0	8.4	4.4	1.3	1.0	12.3	14.2	13.3	9.4
West North Central	28.3	24.6	12.9	10.5	4.1	2.6	1.3	1.2	25.3	36.6	29.8	28.9
North Central[1]	48.2	42.2	26.6	24.5	12.5	7.0	2.7	2.2	37.6	50.8	43.1	38.3
South Atlantic	8.8	13.2	20.9	21.8	47.2	43.3	41.7	41.8	12.6	10.6	17.3	25.9
South Central	14.9	14.3	21.4	21.7	19.4	36.5	46.4	46.4	10.8	9.9	15.0	14.9
South[1]	23.7	27.5	42.3	43.5	66.8	79.8	88.1	88.2	23.4	20.5	32.3	40.8
Mountain	2.9	2.3	2.1	2.5	.8	.4	1	1	7.0	6.0	6.0	4.0
Pacific	8.0	11.7	15.1	15.4	7.6	4.6	14.4	14.8	23.1	19.3	15.9	13.3
West[1]	10.9	14.0	17.2	17.9	8.4	5.0	4.4	4.8	30.1	25.3	21.9	17.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1]Regional totals of subregional production areas.

Figure 5

Total Production and Gross Income from Egg, Broiler, and Turkey Production



Most of this increase occurred in 1973, when farm prices increased 60 percent over a year earlier. Cyclical production patterns were common throughout the 1955-81 period as prices moved up and down. Otherwise, gross income changed little, especially during the fifties and sixties, but earlier egg producers realized much more farm income from sales of fowl than have recent producers. The smaller number of layers and their lower market value has reduced producer income received from sales of fowl for slaughter. Gross income from chickens (excluding commercial broilers) dropped from $537 million in 1950 to $145 million in 1960, to $108 million in 1970, and rose to $137 million in 1981 (a value of only 11 cents per pound).

Costs of Production

The cost of producing broilers, turkeys, and eggs has changed dramatically since 1955. Tremendous gains were made in efficiency, but at times these improvements were overshadowed by price increases for the inputs.

Producers have tended to respond to profits or losses in poultry rather quickly—apparently more quickly to profits than to losses. This responsiveness has meant a close relationship between costs of production and prices. Turkey profits, based on the ERS costs and returns series as published in the *Livestock and Poultry Situation* (formerly the *Poultry and Egg Situation*), averaged about 5 cents per pound RTC basis over the last 10 years. Returns to egg producers averaged about 2 cents per dozen. Costs and returns have been very close for broilers. Economic integration has provided a mechanism for adopting and encouraging technological improvements, thereby increasing efficiency (table 12).

Greater production efficiency, especially in feed conversion and labor use, has held down unit costs of production for poultry products. Feed conversion has improved so that a ton of feed now produces about 37 percent more pounds of broilers, 54 percent more turkey, and 39 percent more eggs than in 1955. Improved feed conversion helps in two ways, by reducing feed cost per unit of production and by reducing labor to handle feed.

Poultry farm labor has also become more productive. Labor required to produce 100 pounds of broilers declined from 5.1 hours during 1945-49 to an average of only 8 minutes during 1976-80. A hundred pounds of turkeys required 13.1 hours during 1945-49, but less than 30 minutes during 1976-80. Meanwhile, labor used to produce 100 eggs dropped from 90 minutes to about 14 minutes. These gains have been achieved through various efficiencies—including more automated equipment, larger houses, and more productive birds. Rate of lay increased steadily from 174 eggs per hen in 1950 to 242 in 1980. Higher productivity enabled producers to meet the demand for eggs with fewer hens—288 million in 1980 compared with 300 million in 1950.

The above efficiencies have been achieved through improved breeding, nutrition, housing and equipment, disease control, and management. Producers have become specialists, and small-volume producers no longer account for a significant proportion of commercial poultry production. Poultry production costs are also affected by the increased productivity in feed grain production.

Poultry and egg production costs actually declined in current dollars until the early seventies, when rapidly rising prices for feed, energy, and other inputs forced costs up (tables 13 and 14). The rapid rise in feed and energy prices in 1973 is evident in these two tables, as is the continued downtrend in constant dollars (or real cost) to produce a unit of product. (Feed and energy influence poultry costs more heavily than they are weighted in the deflator series.) Very rapid increases in prices of major inputs have temporarily interrupted the long-term trend in lower real costs at times, but have been overcome by continued progress and adjustments. Lower real costs resulting from improved efficiencies have been passed on to consumers, thus contributing to expanding consumption of broiler and turkey meat.

Marketing and Product Form

Processors have emphasized marketing, especially product form, to attain growth. Both cutup and further processed broiler and turkey products have grown even more rapidly than total production. Both forms are more than five times their 1965 volume (table 15). More than 42 percent of total certified broiler slaughter is now cut up, and more than 10 percent is further processed. Cutup turkeys constitute 27 percent and further processed more than 36 percent of turkey slaughter.

Consumers prefer cutup and further processed forms for their flexibility and convenience. Retailers, too, prefer handling precut and prepackaged items, because these items are more economical than cutting chicken or turkey in the store, and they can reduce space, labor, and the clutter associated with receiving, storing, cutting, and wrapping. Cutup and further processing generally allow processors to increase both sales volume and markup per unit. This provides a means for servicing outlets using only specific parts of the bird. Fast food chains, experiencing rapid growth, have dramatically increased their use of chicken. These outlets are not equipped for cutting chicken nor for using all the parts and require special cuts, including deboned, filleted, and breaded patties. Processors have responded to these special needs. All but one of the top 50 broiler processors provide

Table 12--Production efficiency factors for eggs, broilers, and turkeys, selected years

Item	1955	1960	1965	1970	1975	1980
Eggs per hen per year	192	209	218	218	232	242
Pounds feed per:						
Dozen eggs	5.83	5.27	4.95	4.55	4.25	4.20
100 pounds broiler	285	251	236	217	210	208
100 pounds turkey	470	505	476	405	333	305
Average market weight (pounds) of broilers	3.1	3.4	3.5	3.6	3.8	4.0
Days required to reach market weight	73	67	N.A.	N.A.	56	52
Total farmwork hours used in producing poultry (1967=100)	197	139	104	88	59	[1]48
Production per hour of labor, used for poultry farmwork (1967=100)	32	55	87	119	175	[1]265

	1945-49	1955-59	1965-69	1976-80
Hours labor:				
Per 100 hens	240	175	97	53
Per 100 eggs	1.5	.9	.4	.2
Per 100 broilers	16	4	2	.5
Per 100 pounds broiler	5.1	1.3	.5	.1
Per 100 pounds turkey	13.1	4.4	1.3	.4

N.A. = Not available.
[1]Data is for 1979.

Sources (*1, 4, 5, 6, 7, 8, 9, 10, 13, 14, 17, 19, 24*).

Table 13--Average production costs for eggs, broilers, and turkeys, selected periods

Period	Eggs			Broilers, live weight			Turkeys, live weight		
	Nominal	Deflated[1]	Index	Nominal	Deflated[1]	Index	Nominal	Deflated	Index
	Cents/dozen		*(1963-68=100)*	*Cents/pound*		*(1963-68=100)*	*Cents/pound*		*(1963-68=100)*
1947-52	39.1	51.2	177	27.1	35.6	239	34.7	45.5	211
1953-57	33.0	40.5	140	20.6	25.3	170	27.6	33.9	157
1958-62	29.1	33.2	115	16.0	18.2	122	22.2	25.3	117
1963-68	27.7	28.9	100	14.4	14.9	100	20.8	21.6	100
1969-72	28.1	24.4	84	14.2	12.3	83	20.4	17.8	82
1973-75	43.5	26.1	90	21.8	13.1	88	31.5	19.0	88
1976-78	41.1	19.6	68	21.3	10.1	68	31.2	14.9	69
1979-81	48.6	17.8	62	26.4	9.7	65	38.0	14.0	65

[1]Deflated or "real" cost equals actual cost divided by index of items used in production, including interest, taxes, and wage rates, 1967=100.

Source (*12*).

either cutup or further processed chicken, and most do both. Multiplant processors tend to specialize by doing most of their further processing in selected plants, although they have cutup operations in most slaughtering plants. These further processing plants often include red meats, thus providing a wider product line, reaching more outlets, and making more use of facilities and distribution services.

Marketing of value-added products has become an important part of most integrated poultry operations. Most firms view the whole ice-packed broiler or frozen whole turkey as the marginal product, and emphasize cutup and further processing in their marketing programs.

The major slaughter firms tend to be the leading processors of cutup and further processed poultry. Although the top nine broiler slaughterers were also the nine largest in cutting up broilers, the relationship is not strictly proportional. More plants are cutting and further processing than are slaughtering (table 16). A number of these operations purchase poultry meat from slaughter plants.

Specialization of plants is also evident in the fact that the largest three or four plants process 20 percent each of total U.S. young chickens, fowl, turkey, and other (table 16). Yet 10 plants are needed to further process this 20 percent of all poultry. Only 3 of those 10 plants processed more than a single class of poultry, and in each case one

Table 14--Annual production costs for market eggs, broilers, and turkeys

Year	Commercial egg production costs			Broiler production costs			Turkey production costs		
	Feed	Other	Total	Feed	Other	Total	Feed	Other	Total
	Cents/dozen			*Cents/pound, live weight*					
1955	20.5	11.5	32.0	13.1	7.4	20.5	20.0	7.0	27.0
1956	19.6	11.7	31.3	12.3	6.7	19.0	19.1	6.7	25.8
1957	18.5	11.7	30.2	11.9	6.3	18.2	18.3	6.3	24.6
1958	18.6	10.8	29.4	11.6	6.0	17.6	17.8	6.1	23.9
1959	18.3	11.9	30.2	11.0	5.7	16.7	17.0	5.9	23.9
1960	17.5	10.8	28.3	10.3	5.4	15.7	15.6	5.8	21.4
1961	18.0	11.0	29.0	10.0	5.1	15.1	15.2	5.7	20.9
1962	18.0	10.6	28.6	9.9	4.9	14.8	15.0	5.9	20.9
1963	18.2	10.2	28.4	10.1	4.7	14.8	15.1	6.0	21.1
1964	17.5	10.2	27.7	10.0	4.5	14.5	14.6	6.2	20.8
1965	17.3	10.4	27.4	9.8	4.7	14.5	14.4	6.4	20.8
1966	18.2	10.0	28.2	9.8	4.9	14.7	14.7	6.5	21.2
1967	17.0	10.7	27.7	9.1	5.0	14.1	14.3	6.6	20.9
1968	16.2	10.8	27.0	8.4	5.1	13.5	13.2	6.6	19.8
1969	16.0	10.6	26.6	8.5	5.3	13.8	13.5	6.7	20.2
1970	16.7	11.6	28.3	8.8	5.4	14.2	14.0	6.8	20.8
1971	16.5	12.0	28.5	9.0	5.3	14.3	13.3	6.9	20.2
1972	17.3	11.6	28.9	9.0	5.3	14.3	13.5	7.0	20.5
1973	29.2	12.5	41.7	16.4	5.8	22.2	25.6	7.5	33.1
1974	31.0	14.4	45.4	15.8	6.2	22.0	22.5	8.2	30.7
1975	29.0	14.5	43.5	15.1	6.2	21.3	22.1	8.6	30.7
1976	28.5	13.0	41.5	14.9	6.2	21.1	22.4	9.0	31.4
1977	27.4	13.5	40.9	15.4	6.3	21.7	22.6	9.0	31.6
1978	27.2	14.1	41.3	15.0	6.5	21.5	22.1	9.6	31.7
1979	30.0	15.1	45.1	16.8	7.8	24.6	25.3	10.5	35.8
1980	32.8	16.3	49.1	17.7	8.4	26.1	26.1	11.0	37.1
1981	35.2	16.3	51.5	20.0	8.4	28.4	30.2	11.0	41.2

Source (*17*).

type dominated. Only 1 of these plants would drop from the top 10 if ranking were based just on the dominant class of poultry processed.

Data were not available to present a comparison over time in table 16, although the volume comparisons shown in table 15 indicate the rapid growth of cutting and further processing. Leading processors stress that this is the most dynamic phase of the industry and have committed themselves to expanding the value-added aspect in their corporate plans.

An imbalance frequently arises between the quantity of parts available and demand for them. Parts prices have varied in the short term, but the most desired parts have increased in price relative to other parts or whole birds. The New York wholesale price of fryer breasts (with wings on), for example, increased from 44 cents per pound in 1970 to 94 cents in 1980, a 115-percent rise, twice as fast as leg prices which rose only 55 percent, from 33 to 51 cents. During the same time, prices for whole fryers rose 73 percent, from 26.3 to 45.5 cents.

Marketing Costs

Each sector of the poultry industry has contributed to the gains that enable consumers to buy chicken, turkey, or eggs at favorable prices. No sector, by itself, would have made much difference, but the cumulative effect of changes in all sectors has been dramatic.

Increased productivity in poultry marketing has also helped keep costs down. Although input prices (for labor, energy, and packaging) more than tripled during 1960-80, unit marketing costs rose by only 77 percent for broilers, 76 percent for turkeys, and 78 percent for eggs. Total costs of assembling, processing, transporting, wholesaling, and retailing make up the farm-to-retail price spreads (table 17). These costs are primarily for services and materials, and thus are mostly cash costs.

Increased density in production, limited procurement distances, larger houses concentrated on fewer production units, and partial mechanization of loading and unloading have held procurement and assembly cost increases

Table 15--Poultry certified under Federal inspection as ready-to-cook at slaughter, used for cutup, and for further processing, selected years

Item	Certified under Federal inspection at slaughter			Cutup under Federal inspection			Inspected and used in further processing[1]		
	Young chickens	Mature chickens	Turkeys	Young chickens	Mature chickens	Turkeys	Young chickens	Mature chickens	Turkeys
					Million pounds				
Total:									
1960	3,699	372	948	N.A.	N.A.	N.A.	102	192	[2] 47
1965	5,194	425	1,330	1,001	11	97	139	310	[2]147
1970	7,161	516	1,567	1,843	9	191	337	392	[2]278
1975	7,966	473	1,716	2,582	10	313	541	356	536
1980	11,175	531	2,263	4,503	2	640	1,107	489	902
1981	11,838	538	2,416	5,022	5	652	1,239	448	884
					Percent				
Total certified slaughter:									
1960	100.0	100.0	100.0	N.A.	N.A.	N.A.	2.7	51.6	[2] 5.0
1965	100.0	100.0	100.0	19.3	2.6	7.3	2.7	72.9	[2]11.1
1970	100.0	100.0	100.0	25.7	1.7	12.2	4.7	76.0	[2]17.7
1975	100.0	100.0	100.0	32.4	2.1	20.0	6.8	75.3	34.2
1980	100.0	100.0	100.0	40.3	.4	28.3	9.9	92.1	39.9
1981	100.0	100.0	100.0	42.4	.9	27.0	10.5	83.3	36.6
					Index (1965=100)				
Growth:									
1960	71	88	71	N.A.	N.A.	N.A.	73	62	[2] 32
1965	100	100	100	100	100	100	100	100	[2]100
1970	138	121	118	184	82	197	242	126	[2]189
1975	153	111	129	258	91	323	389	115	365
1980	215	125	170	450	18	660	796	158	614
1981	228	127	182	502	45	672	891	145	601

N.A. = Not available.

[1]Does not include further processing of whole birds. [2]Further processing of turkeys was not reported separately for other than whole bird processing until 1974; the average proportion used in 1974-75 (58 percent) was assumed as other than whole turkey prior to 1974.

Sources (*17, 20*).

Table 16--Structural comparisons of poultry slaughter, cutup, and further processing for plants under Federal inspection, 1981

Type of processing	Young chicken	Turkey	Fowl	Other	Total poultry
			Million pounds		
Total:					
Slaughter (certified RTC)	11,906	2,509	757	N.A.	N.A.
Cutup[1]	5,204	688	13	48	1,452
Further processing[2]	1,257	973	482	251	2,963
			Number		
Plants performing:					
Slaughter	243	129	72	N.A.	N.A.
Cutup[1]	1,347	175	94	48	1,452
Further processing[2]	579	445	288	330	1,144
Plants with 20 percent of volume:					
Slaughter	9	5	3	--	N.A.
Cutup[1]	8	--	--	--	N.A.
Further processing[2]	4	3	3	3	10
			Percent		
U.S. volume under Federal inspection processed by 8 largest firms:					
Slaughter	41.4	52.6	60.8	83.4	N.A.
Cutup[1]	42.8	68.5	83.5	79.9	N.A.
Further processing[2]	44.7	56.0	66.6	32.3	34.5

N.A. = Not available. -- = Not shown to avoid disclosure of individual firms.

[1]Quantity inspected and used for cutup.

[2]Quantity inspected and used in further processing, excluding further processing of whole birds.

Source (*20*).

Table 17--Estimated farm equivalent value, retail price, and components of farm-to-retail price spreads for eggs, fryers, and turkeys

Years	Farm equivalent value	Procurement and assembly	Processing	Long distance transport and wholesaling	Farm-to-retail price spread	Retail price
			Cents/dozen			
Eggs (grade A large):						
1955-59	37.9	1.0	7.5	3.8	20.1	58.0
1960-64	34.3	.9	7.1	3.7	20.8	55.1
1965-69	34.8	.7	6.3	3.8	20.3	55.1
1970-74	40.4	.9	7.7	4.2	24.5	64.9
1975-79	50.7	1.0	10.1	5.2	30.1	80.8
1980-81	52.0	1.2	12.3	6.0	35.7	87.7
			Cents/pound			
Whole fryers (RTC):						
1955-59	27.5	1.1	5.2	3.5	20.2	47.7
1960-64	21.1	.9	4.4	3.6	19.1	40.1
1965-69	20.5	.9	4.7	3.7	20.3	40.8
1970-74	24.1	1.1	6.2	4.1	24.8	48.8
1975-79	33.6	1.2	8.3	5.3	30.8	64.3
1980-81	37.9	1.5	10.1	6.0	34.9	72.8
Turkeys (RTC)[1]:						
1955-59	34.3	.7	6.3	3.8	20.3	54.6
1960-64	29.0	.7	6.0	3.9	20.1	49.1
1965-69	27.4	.7	6.1	4.2	21.1	48.5
1970-74	37.8	.8	10.0	4.3	28.3	66.1
1975-79	51.1	.9	12.3	5.9	29.8	80.9
1980-81	52.1	.9	14.0	7.1	42.1	94.2

[1]Medium turkeys, 8 to 16 pounds, October-December average.

Sources (*11, 15, 20*).

down, even though transportation and labor are the major components. In addition, many large-volume egg producers now process and carton eggs at the farm.

Processors have benefited from economies of scale, more use of facilities, less seasonality in production, improved and more uniform quality of birds and eggs, shorter hauls from fewer and larger volume growers, and mechanization in processing and handling. Four rather severe changes in the system during the seventies, however, have caused processing costs to rise:

- Energy prices increased rapidly, and many processors added auxiliary units which use other fuels.
- Persistent inflation moved many input prices up at an unusually high rate.
- Environmental considerations forced rapid installation of costly equipment without increasing output. Some of this impact has now been offset by reclaiming waste as byproducts.
- More responsibility for functions such as cutup and packaging have been shifted to the processing level.

These four conditions, particularly the latter two, have affected processing costs for broilers more than for turkeys or eggs.

Wholesaling, including all activities between the processor and retailer, has been shortened and made more direct. Processors now perform more of the functions formerly done by wholesalers and move large volumes directly to retail warehouses. Improved transportation and refrigeration have also provided economies at this stage.

Retailing, which claims the largest share of marketing costs (see table 17), is less influenced by adjustments within the poultry industry than are other stages of marketing. Retail performance is determined by general economic factors rather than by conditions within a particular industry. Although some functions have been shifted from retailer to processor, relative price spreads have not changed to reflect these adjustments fully.

Exports and Imports

Exports of poultry and eggs make up only a very small portion of total U.S. production (table 18). Imports are very low in volume.

Export markets fluctuate more than the domestic market, especially in volume. Foreign markets generally buy to supplement their own supply. Purchases tend to be relatively large in volume and irregular, making it difficult for an individual processor to ship from normal production. Product and handling specifications also present problems since some exporters fill orders by purchasing from several processors. Frequently, the product must be processed for a specific order, and a group of processors cooperates in servicing the export sale.

Export volume expanded significantly during 1980-81. Demand by some major importers had increased and heavy U.S. supplies lowered prices, making trade quite advantageous for both parties. In view of reduced demand and a strong increase in shipments by certain other exporters, however, U.S. poultry and egg exports have dropped from the high levels of 1981, despite continued low prices.

Simulated Costs and Prices

Technology has been improved and applied in poultry production and marketing. Real prices for poultry products declined dramatically during the past two decades. Improved service also has been realized, with plentiful supplies of high-quality products available all year. The poultry industry has been a leader in making physical and organizational improvements in production and marketing, and in passing the benefits on to consumers during the past quarter century. Simulating costs and prices provides a means for describing some of the changes in these economic relationships over time.

The cumulative effect of productivity gains by the poultry industry is measured in this section by holding technology constant and varying input costs with changes in market prices (input prices reflect changes in productivity in those industries). Costs and product prices are simulated by this method and are then compared with actual prices to illustrate the technological gains realized and passed on to the consumer. Technology and input-output ratios were held constant at the 1960 level, and inputs were valued at actual average annual prices. The base was set at the 1960 level because benchmark data were available and prices were relatively stable, although major industry changes had already begun.

Broiler production costs were simulated by multiplying the 1960 feed cost per pound of broilers (10.3 cents) by the annual broiler feed price index (using 1960 as 100, the 1980 index was 232.9). Nonfeed production costs were estimated by multiplying the 1960 cost per pound (5.4 cents) by the current producer price index (PPI) for each year (table 19). Returns to producers above production costs averaged 1.1 cents per pound in 1960, which was multiplied by the current consumer price index (CPI) to obtain the amount which would provide the same real return to producers as 1.1 cents did in 1960. This return was added to simulated feed and nonfeed costs to get the annual average farm value, which was then divided by a constant 72-percent yield factor to convert to an RTC basis.

Table 18--U.S. imports of eggs and exports of eggs, chicken, and turkey, annual average

Item	1960-64	1965-69	1970-74	1975-79	1980	1981
			Million dozen			
Egg exports:						
Shell	13.4	17.7	15.3	38.0	79.1	120.1
Shell equivalent	14.9	3.6	6.7	23.8	58.6	107.4
Total	28.3	21.3	22.0	61.8	137.7	227.5
			Million pounds			
Young chicken exports, RTC	136.8	87.7	99.5	294.3	567.0	719.1
Other chicken, RTC	49.3	13.5	5.6	30.7	53.3	43.6
Total chicken	186.1	101.2	104.1	325.0	620.3	762.7
Turkey exports, RTC	33.6	46.4	36.8	53.5	75.1	63.0
			Million dozen			
Egg imports:						
Shell	1.8	1.3	10.2	8.4	5.0	3.1
Shell equivalent	0	5.2	2.6	.1	.1	.2
Total	1.8	6.5	12.8	8.5	5.1	3.3

Sources (*17, 20*).

Table 19--Simulated retail prices and costs of producing and marketing broilers[1]

Year	Simulated costs and farm value				Simulated marketing costs						Simulated retail price[2]	Actual retail price
	Feed	Nonfeed	Returns	Farm value, live weight	Farm value, RTC basis	Labor	Energy	Packaging and material	Overhead and other	Total marketing		
					Cents/pound							
1955	11.1	4.9	1.0	17.0	23.6	6.3	1.5	1.4	7.0	16.2	39.8	55.2
1956	11.0	5.1	1.0	17.1	23.8	6.7	1.6	1.5	7.2	17.0	40.8	48.9
1957	10.9	5.2	1.0	17.1	23.8	7.0	1.6	1.6	7.5	17.7	41.5	47.2
1958	11.1	5.4	1.1	17.6	24.4	7.4	1.6	1.6	7.7	18.3	42.7	46.1
1959	10.8	5.4	1.1	17.3	24.0	7.7	1.6	1.6	7.6	18.5	42.5	41.2
1960	10.3	5.4	1.1	16.8	23.4	8.1	1.6	1.6	7.7	19.0	42.4	42.4
1961	10.2	5.4	1.1	16.7	23.2	8.2	1.6	1.6	7.7	19.1	42.3	38.3
1962	10.3	5.4	1.1	16.8	23.3	8.5	1.6	1.6	7.7	19.4	42.7	40.5
1963	10.6	5.4	1.1	17.1	23.8	8.7	1.6	1.6	7.7	19.6	43.4	40.8
1964	10.6	5.4	1.2	17.2	23.9	9.0	1.6	1.6	7.7	19.9	43.8	38.6
1965	10.5	5.5	1.2	17.2	23.9	9.2	1.6	1.6	7.9	20.3	44.2	39.6
1966	10.9	5.7	1.2	17.8	24.7	9.6	1.6	1.6	8.1	20.9	45.6	41.6
1967	10.8	5.8	1.2	17.8	24.7	10.0	1.7	1.7	8.2	21.6	46.3	38.7
1968	10.3	5.9	1.3	17.5	24.3	10.6	1.6	1.7	8.4	22.3	46.6	40.8
1969	10.5	6.1	1.4	18.0	25.0	11.2	1.7	1.8	8.8	23.5	48.5	43.4
1970	11.1	6.4	1.4	18.9	26.3	12.0	1.8	1.9	9.1	24.8	51.1	41.7
1971	11.3	6.6	1.5	19.4	26.9	12.8	1.9	2.0	9.3	26.0	52.9	42.0
1972	11.4	6.8	1.6	19.8	27.5	13.6	2.0	2.0	9.6	27.2	54.7	42.7
1973	17.6	7.4	1.7	26.7	37.1	14.5	2.2	2.0	10.5	29.2	66.3	60.8
1974	19.6	8.5	1.8	29.9	41.5	15.8	3.5	2.2	12.1	33.6	75.1	57.0
1975	19.0	9.4	2.0	30.4	42.2	17.3	4.1	2.6	13.4	37.4	79.6	64.3
1976	19.5	9.8	2.1	31.4	43.6	18.8	4.4	2.9	14.0	40.1	83.7	61.2
1977	19.8	10.4	2.3	32.5	45.1	20.4	5.0	3.0	14.8	43.2	88.3	61.9
1978	19.6	11.2	2.4	33.2	46.1	22.0	5.4	3.2	16.0	46.6	92.7	66.5
1979	21.9	12.5	2.7	37.1	51.5	23.8	6.8	3.9	17.8	52.3	103.8	67.7
1980	24.0	14.2	3.1	41.3	57.4	26.0	9.5	4.4	20.3	60.2	117.6	71.9
1981	26.3	15.7	3.4	45.4	63.1	28.6	11.6	4.7	22.4	67.3	130.4	73.7

[1]Simulated by holding technology and inputs constant at the 1960 level and passing through the input price changes.
[2]Price needed to cover costs based on 1960 technology and input-output relationships, with inputs valued at current prices.

Average 1960 marketing costs were adjusted by appropriate price deflators in the same manner as production costs. Marketing labor cost 8.1 cents per pound in 1960, which was multiplied by the index of average hourly earnings of production workers in the food and kindred products industries. The index for fuels, power, and related products was used to adjust the 1.6-cent 1960 energy cost to a current basis for each year. The 1960 packaging and materials cost of 1.6 cents per pound was adjusted by the current index of prices for containers. The 7.7-cent overhead and other costs were multiplied by the PPI for finished goods.

The sum of these adjusted labor, energy, packaging, material, overhead, and other costs is the simulated total marketing cost—19.0 cents in 1960, 24.8 in 1970, and 67.3 cents in 1981. Farm value converted to an RTC plus total marketing cost equals the simulated retail price needed to cover these costs.

Consumers paid an average of 42.4 cents per pound for broilers in 1960, a price which varied only 5.1 cents (annual basis) for the next 12 years. Input prices, however, rose during those years. If those price increases had been passed through to retail, by 1972 consumers would have been paying about 12 cents per pound more than they actually did and $1.30 per pound by 1981, or 56 cents above the actual retail price. Most of this gain by consumers represents cumulative improvements in production and marketing made by the broiler industry. Lower returns per unit to producers and marketing firms also contributed to declining real prices for broilers.

Gains in technology, operating efficiency, economies of size in production and processing units, and strong competitive pressures enabled the expanding broiler industry to offset rising unit prices for off-farm inputs. Meanwhile, feed prices were rather stable during 1955-72, varying less than 15 percent (annual basis).

Production and marketing activities were disrupted during 1973-75 by the rapidly changing prices of inputs and products. Poultry product prices increased, but generally not as rapidly as did costs, and net returns vacillated between large gains and heavy losses as prices moved up and down. Input and product prices moved up with much less volatility during 1975-80. Adjusting to higher product prices, producers increased output rapidly. Real prices for poultry products have resumed their decline,

which had been interrupted by the 1973-75 economic shock.

Turkeys followed a trend similar to that of broilers (table 20). Actual retail prices varied during 1960-81, but were at about the same level in the early seventies as in 1960. Retail prices jumped more than costs did in 1973, but dropped the following year, resuming the upward trend during 1975-80.

Production and marketing costs were simulated for turkeys using the same technique as for broilers (table 20). Feed helped maintain stability in production costs since feed prices increased the cost per pound of gain by only 2 cents during 1960-72. Feed prices increased dramatically in 1973, with subsequent large increases during 1979-80. If production methods had not been changed, input price increases would have led to slowly rising nonfeed costs through 1972, and the rate of increase would have risen sharply through the last decade. Based on costs, simulated farm value for turkeys would have been rather stable throughout the sixties, with a rapid increase in 1973-74 and again during 1979-80.

The gap between actual retail prices and those simulated by passing through price increases for production and marketing inputs is even wider for eggs than for broilers or turkeys. The simulation procedures used for broilers and turkeys would result in a 1981 retail price of $1.72 per dozen for eggs (table 21). Actual prices averaged about 91 cents.

Consumers have enjoyed almost steadily declining real prices for eggs, interrupted only briefly by cyclical swings, food shortfalls, and the rapid inflation of 1973. Despite declining real prices, however, consumers have not increased consumption. In fact, decreases in per capita consumption have interacted with rapid improvements in productivity to hold egg prices down.

Declining per capita consumption, from 320 eggs in 1960 to 265 in 1981, has made industry adjustment difficult. New technology encourages large-volume production units. Individual expansion, however, must come largely by replacing other producers rather than increasing total volume. Total U.S. output rose from 61.6 billion eggs in 1960 to only 69.7 billion in 1980.

Table 20--Simulated retail prices and costs of producing and marketing turkeys[1]

Year	Simulated costs and farm value				Simulated marketing costs						Simulated retail price[2]	Actual retail price
	Feed cost	Nonfeed costs	Returns	Farm value, live weight	Farm value, RTC basis	Labor	Energy	Packaging and material	Overhead and other	Total marketing		
	Cents/pound											
1955	16.9	5.3	6.1	28.3	36.5	5.0	2.3	1.8	7.7	16.8	53.3	61.6
1956	16.6	5.4	6.2	28.2	36.3	5.3	2.3	1.9	7.9	17.4	53.7	56.9
1957	16.4	5.6	6.4	28.4	36.6	5.6	2.5	2.0	8.2	18.3	54.9	53.5
1958	16.4	5.8	6.5	28.7	37.0	5.9	2.4	2.1	8.4	18.8	55.8	52.6
1959	16.3	5.8	6.6	28.7	37.0	6.1	2.4	2.1	8.3	18.9	55.9	51.5
1960	15.6	5.8	6.7	28.1	36.2	6.4	2.4	2.1	8.4	19.3	55.5	55.5
1961	15.7	5.8	6.8	28.3	36.5	6.6	2.4	2.1	8.4	19.5	56.0	44.8
1962	15.9	5.8	6.8	28.5	36.7	6.8	2.4	2.1	8.4	19.7	56.4	49.0
1963	16.3	5.8	6.9	29.0	37.4	7.0	2.4	2.1	8.4	19.9	57.3	49.4
1964	16.2	5.8	7.0	29.0	37.4	7.2	2.3	2.1	8.4	20.0	57.4	49.4
1965	16.3	5.9	7.1	29.3	37.7	7.4	2.4	2.1	8.6	20.5	58.2	49.8
1966	16.5	6.1	7.3	29.9	38.5	7.6	2.4	2.2	8.9	21.1	59.6	50.7
1967	16.5	6.2	7.6	30.3	39.0	8.0	2.5	2.2	9.0	21.7	60.7	47.0
1968	15.8	6.4	7.9	30.1	38.8	8.5	2.5	2.3	9.2	22.5	61.3	48.7
1969	16.2	6.6	8.3	31.1	40.1	9.0	2.5	2.3	9.6	23.4	63.5	52.8
1970	17.1	6.8	8.8	32.7	42.1	9.6	2.7	2.4	9.9	24.6	66.7	55.8
1971	17.5	7.0	9.2	33.7	43.4	10.3	2.9	2.6	10.2	26.0	69.4	56.3
1972	17.8	7.3	9.5	34.6	44.6	10.9	3.0	2.7	10.5	27.1	71.7	56.6
1973	28.7	7.9	10.1	46.7	60.1	11.6	3.4	2.8	11.5	29.3	89.4	90.3
1974	31.4	9.1	11.2	51.7	66.6	12.6	5.2	3.3	13.2	34.3	100.9	71.4
1975	30.3	10.1	12.2	52.6	67.8	13.9	6.1	3.8	14.6	38.4	106.2	78.3
1976	31.5	10.5	12.9	54.9	70.7	15.1	6.6	4.0	15.3	41.0	111.7	78.2
1977	33.4	11.2	13.7	58.3	75.1	16.3	7.5	4.2	16.2	44.2	119.3	81.4
1978	33.1	12.0	14.8	59.9	77.2	17.6	8.1	4.7	17.4	47.8	125.0	87.7
1979	36.7	13.4	16.4	66.5	85.7	19.0	10.2	5.2	19.4	53.8	139.5	88.2
1980	40.5	15.3	18.6	74.4	95.8	20.8	14.3	5.8	22.1	63.0	158.8	95.7
1981	45.2	16.9	20.6	82.7	106.6	22.6	17.3	6.2	24.4	70.5	177.1	92.7

[1]Simulated by holding technology and inputs constant at the 1960 level and passing through the input price changes.
[2]Price needed to cover costs based on 1960 technology and input-output relationships, with inputs valued at current prices.

Table 21--Simulated retail prices and costs of producing and marketing eggs[1, 2]

Year	Simulated production costs and farm value				Simulated marketing costs					Simulated retail price[3]	Actual retail price
	Feed	Nonfeed	Returns	Farm value	Labor	Energy	Packaging and materials	Overhead and other	Total marketing		
	Cents/dozen										
1955	18.6	9.8	8.0	36.4	6.1	1.5	2.9	6.5	17.0	53.4	67.3
1956	18.2	10.1	8.1	36.4	6.4	1.6	3.2	6.6	17.8	54.2	61.5
1957	17.9	10.5	8.3	36.7	6.8	1.6	3.3	6.9	15.6	52.3	58.8
1958	18.0	10.7	8.6	37.3	7.1	1.6	3.4	7.0	19.1	56.4	61.6
1959	18.0	10.7	8.7	37.4	7.4	1.6	3.4	7.0	19.4	56.8	55.0
1960	17.5	10.8	8.8	37.1	7.7	1.6	3.4	7.1	19.8	56.9	56.9
1961	17.5	10.8	8.9	37.2	7.9	1.6	3.4	7.1	20.0	57.2	58.8
1962	17.6	10.8	9.0	37.4	8.2	1.6	3.4	7.1	20.3	57.7	55.3
1963	18.0	10.8	9.1	37.9	8.4	1.6	3.4	7.1	20.5	58.4	56.0
1964	17.7	10.8	9.2	37.7	8.7	1.6	3.3	7.1	20.7	58.4	54.2
1965	17.5	11.0	9.4	37.9	8.9	1.6	3.4	7.2	21.1	59.0	53.1
1966	18.2	11.4	9.6	39.2	9.2	1.6	3.5	7.5	21.8	61.0	59.9
1967	18.2	11.5	9.9	39.6	9.6	1.7	3.6	7.6	22.5	62.1	49.8
1968	16.9	11.8	10.3	39.0	10.2	1.6	3.6	7.8	23.2	62.2	53.2
1969	16.9	12.3	10.9	40.1	10.8	1.7	3.8	8.1	24.4	64.5	62.2
1970	17.8	12.7	11.5	42.0	11.5	1.8	4.0	8.4	25.7	67.7	61.4
1971	18.3	13.1	12.0	43.4	12.3	1.9	4.2	8.6	27.0	70.4	53.4
1972	18.6	13.5	12.5	44.6	13.1	2.0	4.3	8.9	28.3	72.9	53.2
1973	29.1	14.7	13.3	57.1	13.9	2.2	4.6	9.7	30.4	87.5	78.4
1974	32.5	17.0	14.6	64.1	15.2	3.5	5.4	11.1	35.2	99.3	78.1
1975	31.1	18.8	16.0	65.9	16.7	4.1	6.1	12.4	39.3	105.2	76.9
1976	32.0	19.6	16.9	68.5	18.1	4.4	6.5	12.9	41.9	110.4	82.9
1977	32.1	20.8	18.1	71.0	19.6	5.0	6.9	13.7	45.2	116.2	80.5
1978	32.1	22.4	19.4	73.9	21.2	5.4	7.6	14.7	48.9	122.8	77.0
1979	35.5	24.9	21.6	82.0	22.9	6.8	8.4	16.4	54.5	136.5	84.5
1980	39.8	28.4	24.5	92.7	25.0	9.5	9.4	18.7	62.6	155.3	84.7
1981	44.4	31.4	27.0	102.8	27.2	11.6	10.1	20.1	69.0	171.8	90.6

[1]Simulated by holding technology and inputs constant at the 1960 level and passing through the input price changes.
[2]Grade A large eggs.
[3]Price needed to cover costs based on 1960 technology and input-output relationships, with inputs valued at current prices.

Returns above costs to producers have not kept up with the rising general price level. Unit returns to producers have fallen in absolute terms, averaging less per dozen eggs during the seventies than in the sixties, thereby contributing to the relatively low price to consumers. Flock size increased substantially, however, so that an average producer's income may have increased because of the greater number of eggs produced per farm.

Low and steady feed prices held feed costs per dozen eggs stable until 1973, when both actual and simulated costs increased markedly. Fluctuating prices caused simulated and actual feed costs to rise again in 1979 and 1980. Due to generally rising prices, simulated nonfeed costs rose at an increasing rate, especially since 1973. Simulated farm value rose from 37 cents in 1960 to about 42 cents in 1970, and to $1.03 in 1981, nearly double the actual farm price and above the actual retail price.

Simulated marketing costs rose, with labor up from 7.7 cents to 27.2 cents, energy up from 1.6 cents to 11.6 cents, and packaging and material from 3.4 to 10.1 cents. Overhead and other costs rose from 7.1 to 20.1 cents. Rising input prices would therefore have caused marketing costs to increase to 69.0 cents, up from 19.8 cents in 1960.

Under these simulation assumptions, rising input prices during 1960-81 would have driven feed costs up 154 percent for eggs, 155 percent for broilers, and 190 percent for turkeys. Farm value would have risen by 177 percent for eggs, 170 percent for broilers, and 194 percent for turkeys. Input price increases would have boosted marketing costs by 248 percent for eggs, 254 percent for broilers, and 265 percent for turkeys. With these input price increases, simulated retail price increases during 1960-81 were 202 percent for eggs, 208 for broilers, and 219 for turkeys. Actual retail prices, however, rose only 59 percent for eggs, 74 percent for broilers, and 67 percent for turkeys.

Prospects for Continued Progress

Much of the gain in poultry industry productivity is attributable to technological innovations and improved organization and coordination of the various production-

marketing functions. Vertical integration literally moved poultry enterprises from a farm sideline to a highly developed agribusiness. Vertical integration has contributed to a progressive poultry industry in a number of ways: (1) facilitating rapid adoption of improved technology, (2) assisting in financing production, (3) realizing potential economies of aggregation and scale, (4) coordinating flow of products, (5) reducing and controlling risk, (6) improving use of facilities, (7) passing efficiencies through to consumers, and (8) reducing the number of profit-maximizing centers.

In current dollars, poultry and egg production costs increased by about 14 percent per unit during the past quarter century, even though they actually declined through the midsixties. Most of this increase was the result of higher feed prices, which after being stable for two decades, more than doubled during the seventies (with more than half of that increase coming in 1973 alone). Because of limited ability to substitute inputs in the short run, such rapid increases could not be overcome via increased productivity. Indeed, such increases at times proved so disruptive that productivity gains slowed temporarily.

In current dollars, marketing costs for poultry and eggs trended upward during 1955-81. Again the rise did not keep pace with input prices, and the real farm-to-consumer price spreads shrunk. There has, however, been a definite shift in who performs some of the marketing functions.

Improvements will continue, but productivity gains may come more slowly than in the past, both in production and marketing. Feed conversion improvements are significant but smaller than earlier; machines and energy have become more costly substitutes for labor; major economies of scale have already been realized, as have the economies from coordination of the production-marketing functions. Greater responsibility for meeting environmental and other social requirements may also slow productivity gains as measured by units of output.

Poultry producers and processors should continue to shrink in number but grow in output per unit during the eighties with both trends slowing considerably from years past. A few large firms appear to be increasing their positions in production and marketing. These firms, generally well financed and diversified, could bring about sharp increases in industry concentration.

These changing structural characteristics and cost-return relationships raise the question of supply response. Some industry analysts expect these changes to lead to a more stable industry with a less cyclical pattern of over-response. Others contend that fixed investment in facilities and market, plus the size of business involved, make it more difficult to adjust downward. Thus, they expect supply adjustments to be even more "lumpy" (firms delaying usual marginal cutbacks until forced to make major adjustments) than in the past.

Rising energy costs may cause even further concentration of production in geographic areas relatively close to consuming markets. It is unlikely that this will cause significant regional shifts during the eighties; costs appear to favor the present locational pattern.

Further processing should continue to expand. Favorable consumer acceptance permits this expansion, and is encouraged by low returns from whole chicken and turkey, by the adaptability of chicken and turkey, and by their price advantage over other meats.

Bibliography

(1) Adolph, R. H.
Poultry Egg Cost Study, San Diego County - 30 Year Summary 1949-78, Univ. of California Ext. Ser., CP-236 revised Feb. 1979.

(2) Blase, Kenneth, and Sandra LeSesne.
Egg and Poultry Price Spreads, 1971-76, NED Staff Report, ERS, USDA, July 1982.

(3) _____.
Egg and Poultry Price Spreads, 1971-76, SB-595, ERS, USDA, Jan. 1978.

(4) Gallimore, William, and James G. Vertrees.
A Comparison of Returns to Poultry Growers Under Contract vs Operating Independently, ERS, USDA, MRR-814, Feb. 1968.

(5) Halbrook, W. A., Lionel Barton, and D. Martella.
Arkansas Egg Budgets, Special Report 76, Univ. of Arkansas, Jan. 1980.

(6) Lance, G. Chris.
Cost and Returns Analysis for Contract Commercial Egg Producers in Georgia, Georgia Research Bul. 119, Nov. 1972.

(7) Latimer, Robert G., and John Bezpa.
Projections and Cash Flow for a 30,000 Bird Commercial Table Egg Operation, Rutgers Coop. Ext. Service Publication 1/71/700.

(8) Mathia, Gene A.
Egg Production Cost Alternatives, Oklahoma State Univ. Series P-463, Oct. 1963.

(9) Michalson, E. L., R. H. McAlexander, and A. P. Stemberger.
An Economic Analysis of Alternative Egg Production Systems, Penn. State Univ. Bul. 733, June 1966.

(10) Pincock, M. Glade.
An Economic Study of Poultry Management and Egg Marketing Systems, Cornell Bul. 967, June 1961.

(11) Rogers, George B.
Price Spreads, Costs and Productivity in Poultry and Egg Marketing, 1955-74, ERS, USDA, AER-326, Feb. 1976.

(12) _____.
"Poultry and Eggs," in *Another Revolution in U.S. Farming?* by Lyle P. Schertz and others, ERS, USDA, AER-441, 1979.

(13) Saunders, Fred. B., and Edward C. James.
Costs and Returns from Commercial Eggs, Georgia, Bul. N.S. 124, Dec. 1964.

(14) Sykes, Geoffrey.
Poultry, A Modern Agribusiness. Crosby, Lockwood & Son, Ltd., London, 1963.

(15) U.S. Department of Agriculture, Economic Research Service. *Developments in Marketing Spreads for Agricultural Products,* selected issues.

(16) _____.
Farm-Retail Spreads for Food Products, MP-741, May 1975.

(17) _____
Poultry and Egg Situation, various issues.

(18) _____
Livestock and Meat Outlook and Situation, LMS-244 and various issues.

(19) _____.
"*Cost of Producing Broilers,*" paper prepared by Farm Production Economic Div.

(20) _____.
Unpublished data and ERS data books.

(21) U.S. Department of Commerce, Bureau of the Census. Census of Agriculture, various issues, 1974-78.

(22) _____.
Shipment reports.

(23) Watt Publishing Co.
Poultry Tribune, pp. 20-22, Jan. 1981.

(24) _____.
Turkey World, various issues.

Appendix table 1--Consumer price index and price indices for selected production inputs

Year	Consumer price index (CPI)	Producer price index (PPI)	Containers	Fuels and related products and power	Wages in food and kindred industries	Broiler ration	Turkey ration	Laying ration
				Index 1960 = 100				
1950	81.3	84.3	75.4	90.6	59.7	106.4	106.4	N.A.
1951	87.7	92.3	88.5	94.0	64.0	115.9	115.5	N.A.
1952	89.6	91.8	83.7	93.8	68.2	122.2	121.6	N.A.
1953	90.3	90.8	83.8	96.4	72.6	113.8	113.8	N.A.
1954	90.8	91.0	85.3	95.0	75.3	114.8	114.8	N.A.
1955	90.4	91.2	86.5	94.9	78.7	108.1	108.4	106.3
1956	91.8	93.8	92.8	97.8	83.5	107.1	106.2	104.0
1957	95.0	97.2	96.9	103.1	87.7	105.8	104.9	102.3
1958	97.6	99.5	99.2	99.2	92.0	107.5	105.1	102.9
1959	98.4	99.3	98.6	99.2	95.7	104.6	104.3	102.9
1960	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1961	101.0	100.0	99.2	101.1	102.9	99.4	100.9	100.0
1962	102.1	100.3	100.4	100.6	106.1	100.0	102.1	100.6
1963	103.4	100.0	99.2	100.2	109.0	102.8	104.7	102.9
1964	104.7	100.4	98.4	97.5	112.4	102.6	103.7	101.1
1965	106.5	102.1	100.3	99.4	115.1	102.2	104.5	100.0
1966	109.6	105.4	103.0	101.8	119.5	105.9	105.6	104.0
1967	112.7	106.7	104.7	104.1	125.2	104.8	105.7	104.0
1968	117.5	109.7	107.2	102.9	132.8	100.0	101.6	96.6
1969	123.8	113.8	111.3	105.0	140.3	101.7	103.8	96.6
1970	131.1	117.7	116.6	110.5	149.8	107.3	109.7	101.7
1971	136.8	121.3	122.1	119.9	160.2	110.0	112.2	104.6
1972	141.3	125.1	127.6	123.4	170.2	110.7	113.8	106.3
1973	150.1	136.5	135.3	139.8	181.1	171.0	183.9	166.3
1974	166.5	157.4	159.4	216.8	197.2	189.9	201.2	185.7
1975	181.7	174.4	179.5	255.0	216.6	184.1	194.3	177.7
1976	192.2	181.8	189.9	276.4	235.2	189.6	202.2	182.9
1977	204.6	192.7	202.2	314.5	254.6	192.4	213.9	183.4
1978	220.3	207.7	222.5	335.6	275.0	190.6	212.4	183.4
1979	245.1	230.6	246.4	424.7	297.2	213.1	235.3	202.9
1980	278.2	263.4	275.8	596.7	325.2	232.9	259.5	227.4
1981	307.0	290.7	296.6	722.6	353.6	255.4	289.8	254.0

N.A. = Not available on comparable basis.

Appendix table 2--Retail prices for eggs, poultry, and red meats

Year	Eggs, grade A large	Fryers	Turkey	Beef, choice grade	Veal, retail cuts	Pork	Lamb, choice grade
				Cents			
1955	60.3	55.2	61.6	66.8	59.6	53.6	66.6
1956	60.0	48.9	56.9	65.4	60.3	51.4	67.1
1957	57.1	47.2	50.8	69.9	63.8	59.4	71.0
1958	60.1	46.1	52.6	80.2	71.8	63.8	77.3
1959	52.6	41.2	51.3	82.0	76.5	56.3	73.2
1960	56.9	42.4	55.1	80.2	76.3	55.9	72.3
1961	56.8	38.3	44.8	78.4	77.2	58.4	68.4
1962	53.5	40.5	49.0	81.7	80.2	58.8	72.3
1963	54.5	40.8	49.4	78.5	82.4	56.6	74.2
1964	53.8	38.6	46.8	76.5	82.4	55.9	73.5
1965	52.3	39.6	48.1	80.1	84.3	65.8	79.2
1966	59.3	41.6	50.4	84.4	90.0	73.4	85.6
1967	49.2	38.7	48.7	84.6	94.2	66.6	87.2
1968	52.8	40.8	46.4	88.7	101.0	66.8	92.9
1969	62.0	43.4	49.1	89.6	110.8	73.6	100.7
1970	61.2	41.7	56.1	101.7	124.3	77.4	105.5
1971	53.4	42.0	56.3	108.1	135.8	69.8	109.7
1972	53.2	42.7	56.6	118.7	153.9	82.7	118.8
1973	78.4	60.8	90.3	142.1	181.7	109.2	134.3
1974	78.1	57.0	71.4	146.3	194.1	107.8	146.4
1975	76.9	64.3	78.3	154.8	181.1	134.6	167.6
1976	84.1	61.2	73.2	148.2	173.3	134.0	185.6
1977	81.7	61.9	77.3	148.4	175.3	125.4	186.8
1978	77.0	66.5	87.7	181.9	209.5	143.6	219.6
1979	84.5	67.7	88.2	226.3	282.3	144.1	245.7
1980	84.7	71.9	95.7	237.6	309.5	139.5	252.7
1981	90.6	73.7	92.7	238.7	N.A.	152.4	N.A.

N.A. = Not available.

Sources (*16, 17, 18, 20*).

Appendix table 3--Estimated per capita expenditures for eggs, poultry, and red meats

Year	Eggs	Fryers	Other chicken	Turkey	Poultry	Beef	Veal	Pork	Lamb and mutton	Beef and pork	Red meats	Poultry and red meats
						Dollars						
1955	18.10	7.62	4.14	3.08	14.84	42.75	4.65	34.85	2.73	77.60	84.98	99.82
1956	17.91	8.46	3.47	2.96	14.89	43.29	4.76	31.97	2.62	75.26	82.64	97.53
1957	16.72	9.02	3.02	3.00	15.04	45.50	4.66	33.62	2.56	79.12	86.34	101.38
1958	17.19	10.14	2.81	3.10	16.05	49.32	4.02	35.66	2.78	84.98	91.78	107.83
1959	14.96	9.39	2.43	3.23	15.05	50.68	3.60	35.30	3.07	85.98	92.65	107.70
1960	15.20	9.92	1.87	3.36	15.15	51.49	3.89	33.76	3.04	85.25	92.18	107.33
1961	15.06	9.92	1.53	3.32	14.77	51.67	3.55	33.70	3.01	85.37	91.93	106.70
1962	14.24	10.45	1.62	3.43	15.50	54.09	3.69	34.75	3.25	88.84	95.78	111.28
1963	14.25	11.06	1.47	3.36	15.89	54.79	3.79	34.53	3.19	89.32	96.30	112.19
1964	14.25	10.69	1.35	3.42	15.46	56.53	3.54	34.04	2.72	90.57	96.83	112.29
1965	13.65	11.72	1.47	3.56	16.75	58.95	3.62	35.99	2.61	94.94	101.17	117.92
1966	15.43	13.31	1.50	3.93	18.74	64.99	3.42	39.86	3.00	104.85	111.27	130.01
1967	13.15	12.54	1.59	4.14	18.27	66.66	3.02	39.89	3.05	106.55	112.62	130.89
1968	13.88	13.38	1.59	3.67	18.64	72.02	3.03	41.02	3.07	113.04	119.14	137.78
1969	16.03	15.10	1.56	4.03	20.69	73.47	2.99	44.53	3.02	118.00	124.01	144.70
1970	15.76	15.34	1.50	4.49	21.33	85.29	3.23	48.92	3.06	134.21	140.50	161.83
1971	13.82	15.33	1.60	4.67	21.60	90.06	3.26	44.46	3.07	134.52	140.85	162.45
1972	13.43	16.31	1.54	5.04	22.89	101.33	3.23	48.05	3.56	149.38	156.17	179.06
1973	18.89	22.62	2.01	7.68	32.31	114.44	3.09	68.69	3.09	183.13	189.31	221.62
1974	18.46	21.20	2.00	6.28	29.48	125.18	4.08	55.62	2.93	180.80	187.81	217.29
1975	17.76	23.60	2.19	6.66	32.45	136.11	6.70	73.49	3.08	209.60	219.38	251.83
1976	18.92	24.42	1.77	6.66	32.85	139.73	6.07	75.98	2.97	215.71	224.75	257.60
1977	18.18	25.44	1.92	7.03	34.39	135.88	5.96	70.53	2.99	206.41	215.36	249.75
1978	17.47	29.13	1.93	7.98	39.04	158.33	5.45	80.24	2.85	238.57	246.87	285.91
1979	19.54	32.29	1.96	8.73	42.98	176.36	5.08	91.61	3.19	267.97	276.24	319.22
1980	19.28	33.79	2.23	10.05	46.00	181.83	5.26	95.14	3.29	276.97	285.52	331.52
1981	20.01	35.82	2.28	9.92	48.02	184.52	[1]5.29	99.06	[1]3.81	283.58	[1]292.68	[1]340.70

Note: Estimated by multiplying per capita consumption by retail prices shown in appendix table 2 (although not all consumption is at this price, it provides a reasonable standard for comparison).

[1]Retail prices not available for veal, lamb, or mutton. It was assumed these prices rose in the same proportion from 1980 as did beef.

United States
Department of Agriculture

Washington, D.C.
20250

OFFICIAL BUSINESS
Penalty for Private Use, $300

If Your Business is Oils... You Need These Reports

Statistics on Oilseeds and Related Data, 1965-82 ($5.00; 72 pages; SB-695). USDA's lastest annual estimates on production, stocks, disposition, exports, imports, and prices. We've done the legwork for you by culling these statistics from diverse sources and putting them in a convenient one-volume format. The numbers represent the most accurate assessments of Government and private sources, including the Departments of Agriculture and Commerce, the Institute of Shortening, the Chemical Marketing Reporter, and the National Provisioner Report.

More than 100 tables give you the breakdown for cottonseed, flaxseed, linseed, peanuts, soybeans, sunflowers, and edible fats and oils.

U.S. Peanut Industry ($4.75; 52 pages; AER-493). A comprehensive picture of the last three decades of peanut production, consumption, and world trade. The United States accounts for about 10 percent of world exports of peanut oil and is the third largest producer of peanuts (behind India and China). With 10 figures and more than 30 tables, the report tells you:

- Major markets for peanut exports.
- Primary uses for different peanut varieties.
- Causes of yield increases over the last 30 years.
- Major production and marketing practices.
- Effects of Government programs on peanut farmers.

To Order These Reports . . .

Write to *Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.* Make your check or money order payable to *Superintendent of Documents.* You can charge your order on VISA, MasterCard, or with a GPO deposit account; call GPO's order desk at (202) 783-3238. No additional charges for postage to domestic addresses; but foreign addresses, please add 25 percent extra. Bulk discounts available.